JANUARY 3, 1955

More Electrification in 10 Years? . . . p. 20

RAILWAY AGE

One of Five Simmons-Boardman Railway Publications

MODERNIZE AND ECONOMIZE

Florida East Coast Nears Complete Dieselization with 28 New Units

A salute to the Florida East Coast Railway which is nearing complete dieselization this month with delivery of 28 new General Motors locomotive units—5 E9's for passenger service, 16 GP9's for freight service and 7 1200-HP switchers. Dieselization with General Motors locomotives produces maximum economy because, in addition to their well-known operating efficiency, these locomotive units feature standardization of major components with maximum parts interchangeability and low maintenance costs. With this flexible General Motors fleet, the railroad can match motive power to train requirements for better performance and top operating efficiency.

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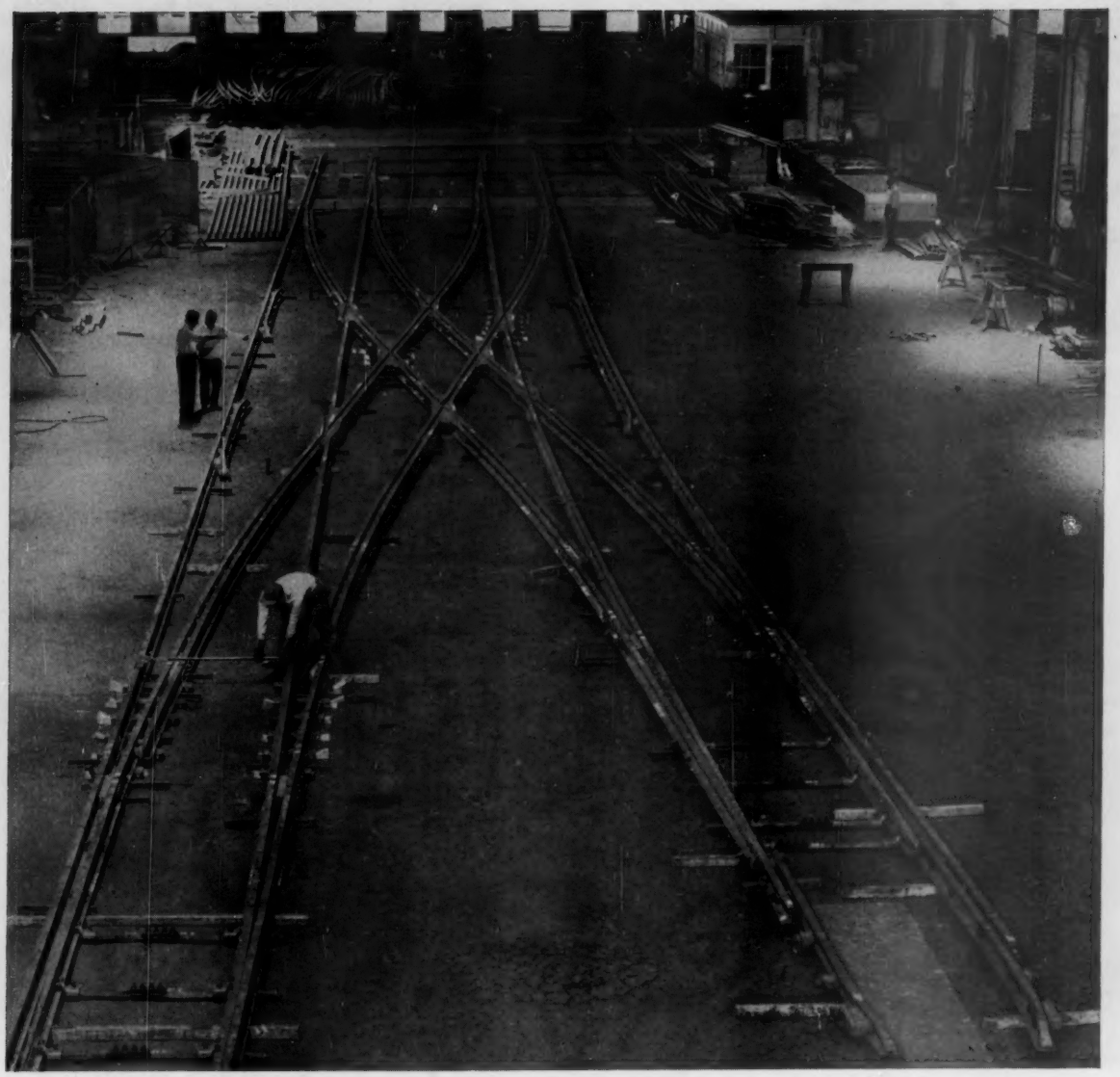

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Yes, we've plenty of room at our Steelton Plant to handle extensive track layouts, and plenty of skill and experience too. So if you're planning a crossover, double slip, or some other complicated item of track, you can bring the problem to Bethlehem trackwork specialists . . . and leave it with them!

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This Bethlehem technique will save you money through elimination of field cutting, curving and drilling of rails. Cuts out scrap loss, too. A Bethlehem engineer will be glad to discuss details and answer your questions. Get in touch with him through the Bethlehem office nearest you.

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January 3, 1955 **Vol. 137, No. 27**

Week at a Glance

FORUM: 1954's most memorable transport policy statement — that by Interstate Commerce Commission Chairman Richard F. Mitchell before the National Industrial Traffic League in November—merits reiteration and emphasis at the beginning of a year which may see major changes in transportation legislation. 13

Utilization of diesel locomotives and another opinion on proper use of budgets fill this week's Question and Answer page. 16

"Nerve center" for a terminal is the purpose of a new combination yard office and dispensary building, from which are coordinated operations of Union Pacific yards in Kansas City. 17

There will be more railroad electrification in 10 years if present trends in traffic requirements, fuel prices, maintenance costs and engineering developments continue, says L. B. Curtis in a paper which expresses his own individual views. 20

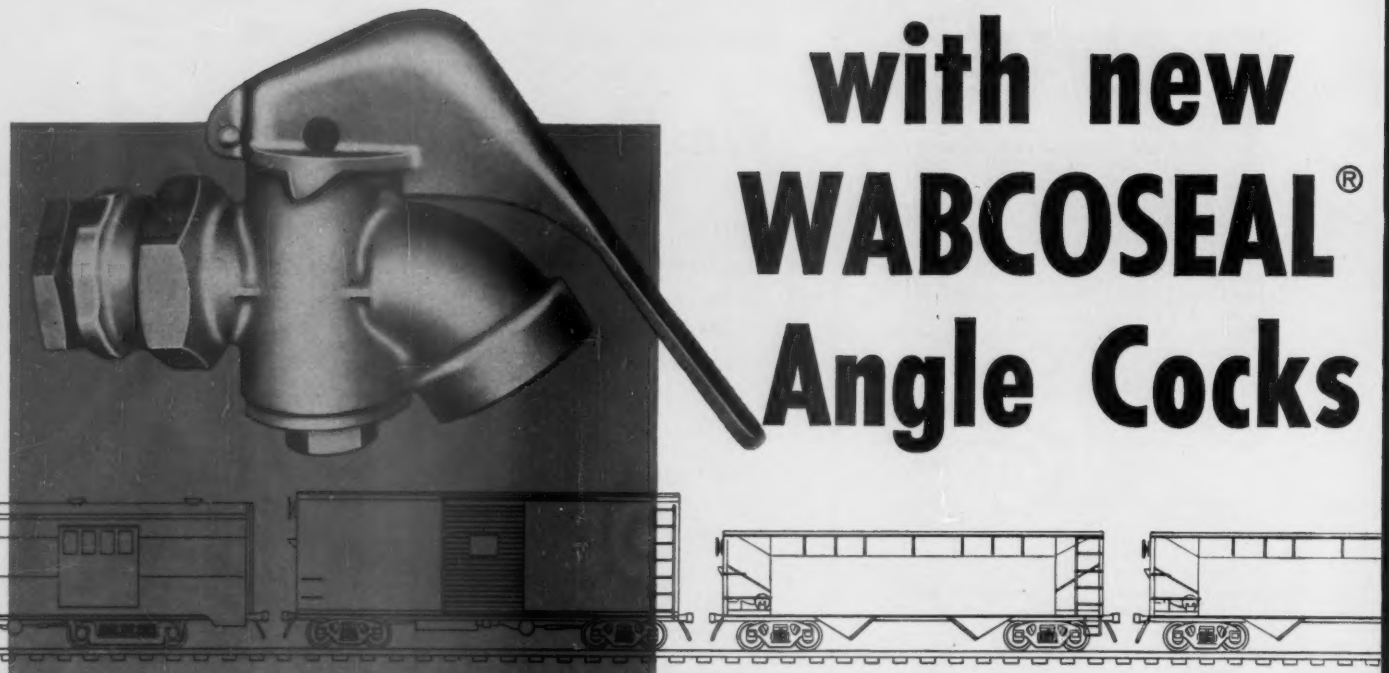
Railroad bearing lubrication *has* made progress thanks to the combined research and development activities of railroads, railroad associations, bearing manufacturers and lubricant suppliers. 23

BRIEFS

"Piggyback" traffic seems to be on the increase, with several roads showing substantial gains in recent weeks. Possibly the most encouraging single sign is the growth in number of regular and "repeat" users. It's not all lcl, either; the Erie, early in December, handled a single shipment of eight trailers, holding 1,144 TV sets.

Canadian truckers are having a tough time making a living on the lower rates they had to publish to meet reductions placed in effect between Toronto and Montreal by the Canadian National and the Canadian Pa-

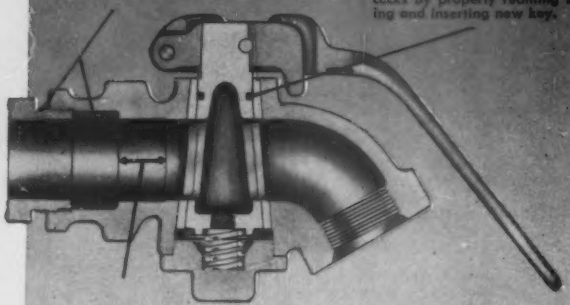
Stop those air leaks with new WABCOSEAL® Angle Cocks



FOR FREIGHT CARS:

Wabco compression ring grips pipe when nut is tightened to provide tight seal and strong clamping action.

"O" ring seals the key effectively through a wide degree of key wear. This seal can be used on old angle cocks by properly reaming the bushing and inserting new key.



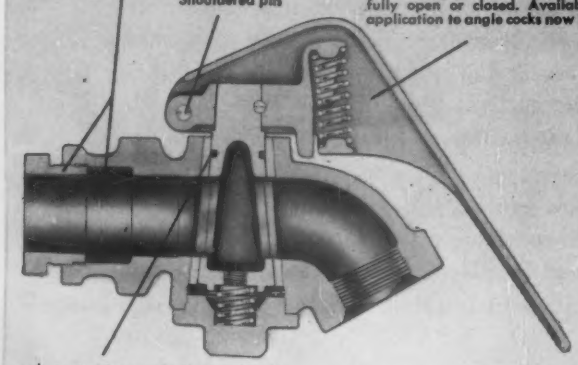
Brake pipe nipple length can fall anywhere within this range and still be perfectly sealed. Threaded nipple is not necessary but can be used if more convenient.

FOR PASSENGER CARS AND LOCOMOTIVES:

New Wabcoseal fitting is same as for freight car angle cock shown above.

Shouldered pin

Strong spring is compressed when handle is raised. Socket is snapped into locking position when handle is fully open or closed. Available for application to angle cocks now in use.



Sealed key is identical to freight car angle cock key shown above.

DON'T tolerate a high air leakage rate on your trains. Use the new Wabcoseal Angle Cocks for tighter seals.

The sealed key is new, with an "O" ring seal that stays tight through a wide range of key wear.

The brake pipe connection is new. A rugged Wabco compression ring replaces the old tapped thread. Tolerance for length of pipe nipple is now provided.

The spring-locking handle is new for passenger cars and locomotives. When the handle is removed to fully open or closed position a strong spring snaps the socket into locked position and keeps it there. A shouldered pin provides proper freedom of handle movement.

The sealed key and spring-locking handle are available for application to present angle cocks. See your Westinghouse Air Brake representative for more information.

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AIR BRAKE DIVISION WILMERDING, PA.

NEW MOVIE AVAILABLE entitled, *"AT THIS MOMENT"*—showing a vivid story of modern railroad progress. Length 26 minutes, on 16 mm. color sound film. For use of film write: United World Films, Inc., 1445 Park Ave., New York or Association Films, Inc., 347 Madison Ave., New York.

Current Statistics

Operating revenues, ten months	
1954	$7,779,882,274
1953	9,016,553,959
Operating expenses, ten months	
1954	$6,158,779,123
1953	6,780,942,483
Taxes, ten months	
1954	$ 740,059,728
1953	1,085,573,098
Net railway operating income, ten months	
1954	$ 671,488,608
1953	952,692,110
Net income, estimated, ten months	
1954	$ 472,000,000
1953	740,000,000
Average price railroad stocks	
December 28, 1954	85.94
December 29, 1953	57.55
Carloadings, revenue freight	
Fifty-one weeks, 1954	33,301,804
Fifty-one weeks, 1953	37,820,167
Average daily freight car surplus	
December 18, 1954	40,198
December 19, 1953	91,963
Average daily freight car shortage	
December 18, 1954	192
December 19, 1953	95
Freight cars on order	
December 1, 1954	14,805
December 1, 1953	31,869
Freight cars delivered	
November 1954	1,302
November 1953	6,137

RAILWAY AGE IS A MEMBER OF ASSOCIATED BUSINESS PUBLICATIONS (A.B.P.) AND AUDIT BUREAU OF CIRCULATION (A. B. C.) AND IS INDEXED BY THE INDUSTRIAL ARTS INDEX, THE ENGINEERING INDEX SERVICE AND THE PUBLIC AFFAIRS INFORMATION SERVICE. RAILWAY AGE INCORPORATES THE RAILWAY REVIEW, THE RAILROAD GAZETTE, AND THE RAILWAY AGE GAZETTE.

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Week at a Glance CONTINUED

cific (*Railway Age*, November 1, page 13). The president of the Canadian Truckers Association is reported to have said that many lines have suffered a reduction in business, despite rate cuts. A strategy to hold business without further rate reductions is said to include formation of a Ship-by-Truck association.

Ground has been broken for the Santa Fe's new $7-million main line into Dallas, Tex.

Radio on a track motor car for use by communications linemen is being installed by the Southern Pacific. The linemen, operating in the vicinity of Mt. Shasta in the Sacramento River canyon in northern California, will be able to talk with their headquarters in Dunsmuir, Cal., and promptly obtain information of line wire trouble.

A new Santa Fe baggage car, built by ACF, is the second car to be squeeze-tested in the hydraulic machine recently installed at the AAR Research Center, Chicago. This 74-ft stainless-steel-sheathed car withstood over 800,000 lb end pressure with nominal deflection (about ½ in.) between bolsters and no permanent set or signs of distress in the car structure.

A new car ferry may be added to the Ann Arbor's trans-Lake Michigan fleet. Specifications are being completed and will be sent out for bids shortly. Modernization of the company's present fleet of five vessels also is being planned; that work will be carried out on one vessel at a time to minimize disruption of service between Frankfort, Mich., and the several Wisconsin ports the AA serves.

More freight by air is the objective of a sales training course now being conducted by American Airlines. The newly trained salesmen will reportedly try to bring in new customers who are now using other means of transportation, by presenting cost analyses designed to show advantages of air freight.

Leasing Rules Delay Urged

ICC examiner proposes further postponement to March 1, 1957 of effective date for trip-lease, revenue-splitting bans

An Interstate Commerce Commission examiner has recommended that the commission's proposed ban on trip-leasing and revenue-splitting in leased truck operations be postponed at least to March 1, 1957. The extension would enable the ICC to examine accident reports specially broken down so as to show truck safety records under trip-lease operations and to "appraise" the affects of revenue-splitting on competition.

Examiner Henry C. Lawton stated in a 69-page proposed report that he had found "no definitive answer" to the trip-lease issue and that there has not been time to test whether the revenue-splitting practices constitute unfair competitive advantages.

The ICC has already postponed the effective date of the two rules to March 1, 1955 (*Railway Age*, December 7, 1955, page 14). The ban on trip-leasing would be accomplished by a rule requiring that rentals of equipment be under leases of "not less than 30 days." The other disputed rule would prohibit rental payments under revenue-splitting agreements.

Two Viewpoints—Mr. Lawton stated that "In a narrow view of the issues . . . It readily could be found that the opponents of the two rules under consideration have not sustained the burden of showing a need for modification or elimination of such rules." He added though, that this "ignores the recent legislative history" and said "it can be found, with equal reason, that there is no immediate or imperative reason for imposing the two requirements at this time."

However, the examiner warned, "once eliminated from the leasing rules it would be difficult to reinstate either of them no matter how great the emergency which might necessitate such action on the part of the commission."

During his recommended two-year postponement Mr. Lawton would have authorized carriers be required by a commission order "to segregate all reportable accidents reported according to whether the accident involves company-owned, term-leased or trip-leased equipment together with a statement as to the amounts in moneys of the claims incurred in connection with accidents involving all three classes of equipment."

Accident Segregation—This segregation of reports would, Mr. Lawton said, provide data which is "essential in order to pass on the question as to whether safety of operations of motor carriers generally is impaired through the use of trip-lease equipment. There is some evidence that the standards of inspection by the lessees of equipment and check of drivers' qualifications is not, or cannot be, as complete in the case of equipment utilized only for one trip. Of course, if this is not true, and trip-leased equipment is as free from violations of the safety regulations as the opponents of the rules claim, the only ground for restricting trip-leasing would be the economic one."

Revenue-splitting, he said, "in addition to being a powerful competitive weapon . . . is susceptible of being used as a device to cloak an unlawful lease of operating rights or an illegal extension of operations." The same, he added, might also be said of "any other system of compensation."

Special Carriers—Mr. Lawton also proposed modification of section 207.3 of the leasing rules relating to exemption of common and contract carriers. This "liberalization," he said, affords these carriers the "maximum opportunity of assisting each other in emergencies" by allowing one carrier to lease his equipment to another for service to points off the routes of the first carrier.

Referring to objections of agricultural groups who, he said, feared too strict interpretation of the rules, the examiner said a "reasonable and liberal" construction would enable exempt commodity carriers to trip-lease equipment back to their starting points in one or a series of movements via "reasonably direct routes." It would also allow movement from a delivery point to "any" other point from which it could then be trip-leased back to the originating area. Further liberalization to insure maximum freedom of movement would "undoubtedly be favorably considered by the ICC."

C & D BATTERIES, INC., Conshohoken, Pa., held a two-day open house November 29 and 30 to mark the formal opening of this new plant. On November 29, 1953, C & D was struck by a disastrous fire, which destroyed more than 75% of its former plant. By hard work, and with the help of its suppliers and of local business people, C & D was back in limited production in three days and in full production by Christmas. The new plant has been greatly enlarged and is of fireproof construction. New and improved processes for manufacture of storage batteries have been put into operation. Laboratory and cafeteria facilities were enlarged.

Mather Sees "New Horizons" in Canada

"New horizons in railroading are opening up in the Canadian North," W. A. Mather, president of the Canadian Pacific, told the Canadian Railway Club in Montreal on December 13. Railway building projects recently completed or now under way, he said, represent a capital investment of more than $275 million, and will add nearly 1,200 miles of track to Canada's rail network.

"Only the most ardent pessimist," Mr. Mather declared, "would assume that resource development in Canada has reached its peak. . . . With each new discovery, other modes of transport notwithstanding, the need for further extending Canada's rail network will continue to manifest itself in new building" because "the railway is still an indispensable transportation tool" for "pioneering the hinterland."

The CPR president warned, however, that "the greatest challenge in transportation in Canada today lies in the fact that competition has come of age. . . . Yet the dead hand of the past, in the form of regulatory devices appropriate only to monopoly conditions, still prevails."

This situation, in Mr. Mather's words, creates another "new horizon" in Canadian transportation, and "the one likely to be the most rewarding in terms of national wellbeing and prosperity." That "horizon," he said, "is the growing awareness that Canada's railways cannot indefinitely continue to serve two masters—the master of regulation and the master of competition."

WESTERN MARYLAND traffic officers met recently at Baltimore to inspect progress on the railroad's new million-dollar freight distribution center at Hillen station. Included in the group were, left to right: J. G. Lawless, general agent, San Francisco; W. A. Grotz, president; A. E. Bowine, general agent, Pittsburgh; C. I. Hughes, traffic representative, St. Louis; C. R. Zarfoss, vice-president — traffic; A. J. Leamy, general agent, Chicago; and I. C. Kuhns, general agent, New York.

Operations

Test Enlarges Piggyback Possibilities

That hanging carcass fresh meat can be successfully shipped by "piggyback" is the conclusion of a test sponsored by the Liquid Carbonic Corporation, of Chicago. Those participating included the Chicago Great Western, the Des Moines Transportation Company, and a major meat packing company.

The test was made on a load of hanging fresh meat shipped in a 32-ft semi-trailer on flat car from Omaha to Chicago last November. Since the center of gravity is elevated in that type of load, its effect on flat car operation was thoroughly studied. To meet temperature requirements, a commercially available automatic dry ice refrigerating unit was used. It was of the non-mechanical and self-contained type, requiring no outside power connection.

The test is said to have proved that: (1) Hanging meat can be safely shipped by piggyback, and (2) dry ice refrigerating equipment is adaptable to piggyback for shipping some perishables.

NP, GN Cut 24 Hours From Westbound Freight Runs

Beginning January 12, the Northern Pacific and the Great Northern will cut 24 hr from the running time of westbound transcontinental time freight trains between the Twin Cities and Pacific Northwest cities such as Spokane, Seattle and Portland.

The NP said the new service would permit fourth morning delivery at Seattle, Portland or Tacoma, instead of the present fifth morning delivery. Service by connection from Chicago will be correspondingly reduced from sixth to fifth morning delivery. The change also will affect time to Spokane and to Washington and Oregon coast points.

The GN said its new Minneapolis-Spokane running time will be 46 hr, 20 min—18 hr less than at present. From Minneapolis to Seattle and Portland running time will be 61 hr, 30 min—24 hr less than at present. The service will be handled by an entirely new train leaving Minneapolis every morning and handling carloads only for Spokane and beyond. Traffic received from connections at Billings, Mont., and Laurel also will be handled. Other present main line freight services will be unchanged.

"Overland" Streamliner To Turn Back at Omaha

The Southern Pacific has announced that, for the winter months, the "San Francisco Overland"—operated jointly between Chicago and San Francisco by the Chicago & North Western, the Union Pacific and the SP—will operate only between Omaha and San Francisco.

The change will take place January 9, at which time operation of the "Gold Coast" between Chicago and San Francisco by the same roads will be discontinued entirely (*Railway Age*, November 8, page 11). The only through service remaining between Chicago and San Francisco will thus be the "City of San Francisco" streamliner—from which the SP has removed its extra fare charges. This train will handle the New York-San Francisco through sleeping car formerly handled by the "San Francisco Overland."

Diesel's Fuel-Cost Showing Still Tops

Diesel-electric freight locomotives in 1954 produced 80% more gross ton-miles per dollar of fuel expense than coal-burning steam locomotives or electrics. On the same basis, the diesels' output was nearly three times that of oil-burning steam locomotives.

That showing was indicated by figures for the first nine months of 1954 which were published in the "Monthly Comment" of the Bureau of Transport Economics and Statistics of the ICC.

The nine-months' figure for diesels showed that they produced 5,371 gross ton-miles per dollar of fuel expense. Comparable figures for other types of motive power were: Coal-burning steam locomotives, 2,952; oil burners, 1,849; electrics, 2,903.

The 1953 figures were higher for all types of motive power except coal burners. The bureau explained that this reflected "in no small degree" changes in the unit cost of fuel. Only coal, down 2.2% from $5.52 per net ton to $5.40, was cheaper in 1954 than in 1953. Fuel oil was up 18.8%, from $1.65 per barrel to $1.96; diesel fuel rose 1.7% from 9.9 cents per gallon to 10.07 cents; and electric current was up 6.8%, from 1.088 cents per kilowatt hour to 1.162 cents.

The bureau's figures also showed that diesels performed 84.2% of the

NOT TAIL PIPES for moon rockets, but calibrated air nozzles used in the General Electric Company's Locomotive & Car Equipment plant laboratory to find ways of increasing output of traction equipment within design and size limitations of a locomotive. The nozzles and chamber are used as part of a continuing study of air flow requirements of locomotive motors and generators and the effectiveness of different fan and blower designs.

freight service (as measured by gross ton-miles) on Class I railroads in the first nine months of 1954. That was an increase from 73.9% in the first nine months of 1953. Meanwhile, the coal burner's share was down from 19.2% to 11.8%, the oil burner's share dropped from 5.1% to 2.1%, and the electric's share was up from 1.8% to 1.9%.

New CPR Train Will Be Named "Royal Canadian"

The Canadian Pacific's all-stainless-steel transcontinental streamliner, to begin service next spring between Toronto-Montreal and Vancouver, will be called the "Royal Canadian." By late spring, the road has announced, the Budd Company will have completed deliveries of all 173 cars ordered by the CPR to equip the new service. The first unit was received last summer (*Railway Age*, July 5, page 10).

Organizations

Deegan Resigns As FRP Chairman

The Federation for Railway Progress has announced the resignations of Thomas J. Deegan as chairman and of Clifford H. Ramsdell as secretary-treasurer—in conformance with proposed changes in FRP's constitution, under which corporate memberships in the federation by railroads would no longer be provided for. Class I railroad members of the federation, heretofore, have been the Chesapeake & Ohio and the Central of Georgia.

Mr. Deegan is now a vice-president of the New York Central and Mr. Ramsdell its director of advertising.

James G. Lyne, president of the Simmons-Boardman Publishing Corporation, and editor of this paper, has been elected chairman of FRP to succeed Mr. Deegan; and Charles P. Whitehead, president of General Steel Castings Corporation, has been elected a vice-president. William R. Merriam, public relations vice-president of the FRP, will serve also as secretary-treasurer, succeeding Mr. Ramsdell in that capacity.

Messrs. Whitehead and Lyne are members of a 12-member committee (under the chairmanship of Maurice N. Trainer, vice-chairman of American Brake Shoe Company) named at the recent annual meeting of the Railway Business Association to study reorganization of that association. Their names, as well as those of several other representatives of the railway supply industry, were suggested to FRP by the Trainer committee as nominees available for vacancies on the executive council of the federation, to the degree that the federation should desire to increase participation by the supply industry in its operations.

Latest developments in rectified power for railway utilization, and other applications of electricity to prime movers, will be discussed on February 1, in two sessions of the five-day winter general meeting of the **American Institute of Electrical Engineers** at the Hotel Statler, New York. A total of eight papers will be presented during the full day session on land transportation.

A. J. Serieno, assistant engineer, brake equipment, New York Central, will speak on "Operation and Maintenance of Disc Brakes on Passenger Trains," at the January 14 meeting of the **Eastern Car Foreman's Association** in the Engineering Societies building, New York. A buffet supper at 6 p.m. at the Old Timers Grill will precede the meeting.

At the January 20 dinner meeting of the **New York Railroad Club** at the Hotel Commodore the topic for discussion will be "Progress of Eliminating Overheated Journals on Plain Bearings." Speakers will include R. G. May, vice-president, Association of American Railroads; H. M. Wood, assistant chief of motive power—car, Pennsylvania; C. E. Pond, general superintendent motive power, Norfolk & Western; M. S. Clark, Texas Company; R. W. Seniff, manager of research, Baltimore & Ohio; and R. L. Wilson, vice-president, American Brake Shoe Company. The dinner will start at 7 p.m. and the meeting at 8:15.

H. J. McKenzie, president of the St. Louis Southwestern, who was to have been the speaker at the December meeting of the Mississippi Valley Maintenance of Way Club, is now scheduled to speak on "Railroading and the Wide Open Spaces" at the January 10 meeting, at 6:30 p.m., Hotel DeSoto, St. Louis.

Equipment & Supplies

LOCOMOTIVES

Class I Roads Install 1,023 Locomotives in 11 Months

Class I railroads put 1,023 new locomotive units in service in the first 11 months of 1954, compared with 1,990 in the comparable 1953 period, the Association of American Railroads has announced. The 1954 installations included 1,008 diesel-electric units and 15 gas turbine-electric locomotives; the 1953 total, 1,972 diesel-electric units and 14 steam and four gas turbine-electric locomotives.

November 1954 installations by Class I railroads totaled 37 new locomotive units, all diesel-electric, compared with November 1953 installations of 150 diesel-electric units and one steam locomotive.

On December 1, Class I roads had on order 267 new locomotive units, including 257 diesel-electric units and 10 electric locomotives, compared with

634 diesel-electric units and one steam, 10 electric and 15 gas turbine-electric locomotives on order December 1, 1953.

The **Baltimore & Ohio** has ordered 86 diesel-electric locomotive units, as follows: From the Electro-Motive Division of General Motors Corporation—29 900-hp yard switchers, 28 1,750-hp four-motor road-switchers, two 1,750-hp six-motor road-switchers, and four 2,400-hp road passenger units; from the American Locomotive Company—11 1,000-hp yard switchers; from the Baldwin-Lima-Hamilton Corporation—nine 1,600-hp four-motor road-switchers; and from Fairbanks, Morse & Co.—three 1,600-hp four-motor road-switchers. Delivery of the new units will begin in April and be completed in June.

Denver & Rio Grande Western. —See "New Facilities" column.

PASSENGER CARS

New Haven Considering Grumman-Built Train

The Transportation Development Corporation, New York, is reported to be working on the engineering and design of a lightweight passenger train for the New York, New Haven & Hartford, which, if accepted by the railroad, would be built by the Grumman Aircraft Engineering Corporation, Bethpage, N.Y. (*Railway Age*, December 27, page 5).

The TDC, formed earlier this year (*Railway Age*, May 24, page 44) to promote the "Hastings" lightweight train and prestressed concrete roadbed, states that the train will be capable of speeds up to 175 mph and will carry 256 passengers in its four cars. John A. Hastings, vice-president of TDC, stated his belief that, with this train, it would be economically possible to provide 100-mph service between New York and Boston at "one-dollar-per-hour" fares. If the design is accepted, it is Mr. Hastings' opinion that delivery of a complete train could be made late this year.

The tentative design of the new train is said to call for use of three Packard 600-hp diesel engines. These 12-cylinder engines will drive generators which will, in turn, power direct-drive electric motors for propulsion. When supercharged, the engines are reported to be capable of developing 900 hp each. The final report on the design of the train will be presented to the New Haven on or about January 7.

Briefly . . .

. . . Three historic pieces of rolling stock, a coach, a coach-baggage combine and a box car—all bearing the name of the Great Northern's earliest predecessor, the St. Paul & Pacific—have been placed on permanent exhibition on a special track at the GN's St. Cloud, Minn., shops. The cars have been used by the GN for display purposes for many years, along with the 1862-vintage locomotive "William Crooks," which is now on permanent display in the St. Paul Union Depot. The two passenger cars, actually built in 1882, were subsequently re'ashioned to duplicate cars of the 1860's. The freight car was built in 1879.

FREIGHT CARS

The **Baltimore & Ohio** has ordered material for construction in its DuBois, Pa., shops of 100 70-ton 53½-ft flat cars. The cars will be completed during March of this year.

Denver & Rio Grande Western. —See "New Facilities" column.

The **Lackawanna** is inquiring for 50 75-ft flat cars for piggyback service.

The **Southern** is inquiring for 1,000 50-ton 50½-ft steel sheathed box cars.

IRON & STEEL

The **Lackawanna** has ordered 5,000 tons of rail from the U.S. Steel Corporation and the Bethlehem Steel Company.

Traffic

1st Quarter Loadings Seen Up 1.4%

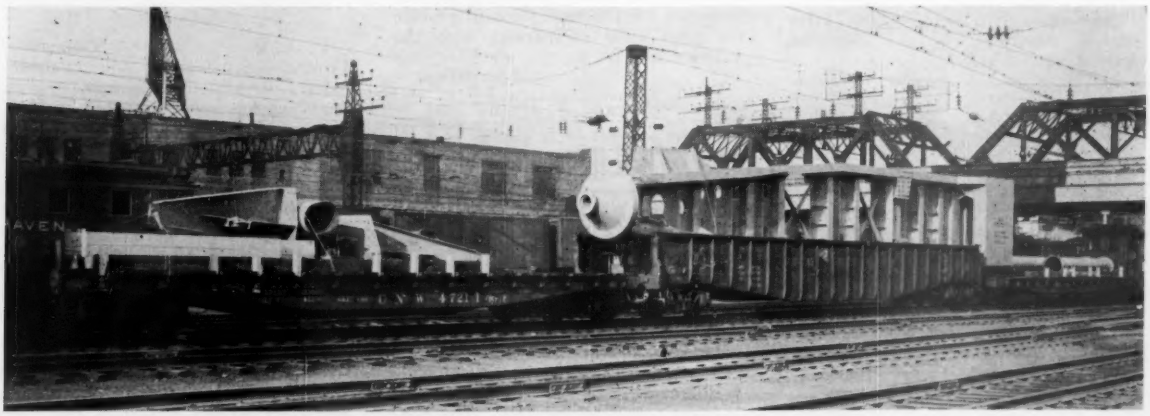
An increase of 1.4% in freight car loadings in the first quarter of this year, compared with the same period in 1954, has been predicted by the 13 Regional Shippers Advisory Boards.

On the basis of the estimate, loadings of the 32 principal commodities will be 5,922,313 cars in the first quarter of 1955, compared with actual loadings of 5,841,216 cars in the corresponding 1954 quarter. Eight of the boards predicted increases, while 5 expected decreases.

Education

General Railway Signal Continues RPI Fellowships

Two fellowships for support of graduate work at Rensselaer Polytechnic Institute in the college year opening next September have been established by the General Railway Signal Company. Each of the two awards, open to present seniors in electrical or me-



AN UNUSUAL RAILROAD FREIGHT MOVEMENT recently was accomplished by the Canadian National and the Central Vermont in moving a large steel fabrication, called a "dredge ladder" (above), from Levis, Que., to Perth Amboy, N. J. The shipment moved over those roads and the New Haven on through-freight schedules, being handled on a car float from Oak Point, on New York City's Harlem river, to Perth Amboy.

chanical engineering at Rensselaer, will provide a stipend of $1,500 in addition to meeting full tuition costs in a year of graduate study leading to a master's degree.

This will be the second year in which such fellowships have been established by General Railway Signal.

Figures of the Week

Freight Car Loadings

Freight car loadings for the week ended December 25 were not available when this issue of *Railway Age* went to press.

Loadings of revenue freight for the week ended December 18 totaled 641,871 cars; the summary for that week, compiled by the Car Service Division of the Association of American Railroads, follows:

REVENUE FREIGHT CAR LOADINGS
For the week ended Saturday, December 18

District	1954	1953	1952
Eastern	108,639	105,572	121,651
Allegheny	117,164	118,882	145,123
Pocahontas	50,283	45,415	55,843
Southern	119,465	116,352	132,506
Northwestern	76,232	69,313	77,499
Central Western	113,596	108,514	118,897
Southwestern	56,492	54,386	58,871
Total Western Districts	246,320	232,213	255,267
Total All Roads	641,871	618,434	710,390
Commodities:			
Grain and grain products	45,319	38,850	44,625
Livestock	8,257	7,860	8,400
Coal	127,877	117,643	141,792
Coke	9,572	10,903	15,201
Forest products	42,649	39,367	47,110
Ore	15,409	18,186	20,517
Merchandise l.c.l.	59,874	60,631	68,316
Miscellaneous	331,914	324,984	364,429
December 18	641,871	618,434	710,390
December 11	653,531	651,951	721,342
December 4	661,797	662,026	719,324
November 27	583,515	596,230	670,371
November 20	697,346	725,732	811,073
Cumulative total, 51 weeks	33,301,804	37,820,167	37,464,455

In Canada.—Carloadings for the seven-day period ended December 7 totaled 74,998 cars, compared with 108,438 cars for the previous 10-day period, according to the Dominion Bureau of Statistics.

	Revenue Cars Loaded	Total Cars Rec'd from Connections
Totals for Canada:		
December 7, 1954	74,998	28,035
December 7, 1953	74,502	28,179
Cumulative Totals:		
December 7, 1954	3,467,412	1,329,680
December 7, 1953	3,768,446	1,527,094

Competitive Transport

Air Lines' Fatality Rate Down in 1954

Regularly scheduled domestic air lines will have a 1954 fatality rate of 0.09 passengers killed per 100 million passenger-miles flown, the Civil Aeronautics Administration has estimated.

The estimate was included in CAA's year-end review of 1954 developments in the field of civil aviation.

In comparing its 1954 estimate with railroad safety records, the review used the railroads' 1953 rate, which was 0.16 fatalities per 100 million passenger-miles. The air lines' rate for that year was 0.56—more than three times the rail rate. And the railroad rate for the first 10 months of 1954 was down to 0.07. Upon inquiry, it was conceded at CAA that this 0.07 ("if it can be projected for the year") would provide the most valid comparison with the estimate of 0.09 for the air lines.

ROBERT HARNDEN, of Wynnewood, Pa., examines one of the original carpetbags used by his grandfather, William F. Harnden, who founded the express business 115 years ago when he began carrying packages on an organized basis between Boston and New York. Showing it to him is President A. L. Hammell of the present-day Railway Express Agency. Mr Harnden saw the bag—also the original sign which hung outside his grandfather's express office and an exact, handmade model of an early Wells, Fargo stagecoach—at the Christmas Honors luncheon of the Newcomen Society of North America, where that organization paid tribute to the life and work of the express founder and heard an address on the industry's history by Mr. Hammell.

New Facilities

Rio Grande Budget for '55 Set at $7.6 Million

Acquisition of 18 additional diesel locomotive units, 100 double-deck stock cars, 26 track-miles of new 115- and 119-lb rail, and two major line changes highlight the Denver & Rio Grande Western's budget for 1955. The road has announced expenditures of $7.6 million, compared to $6 million for last year.

The additional locomotives, when delivered, will result in "virtually complete" dieselization of the 2,100-mi carrier, although plans call for a few steam locomotives to be maintained on a standby basis for peak traffic periods.

In addition to the new stock cars, the road will acquire 10 more "DF" box cars for special lading and 10 cabooses. The stock cars will be built at the company's Burnham (Denver) shops. Approximately $3.3 million has been set aside for the new locomotives; "nearly" $1 million for the cars, and an additional $100,000 for improvements to existing equipment.

The $1-million rail program for main line sections will be augmented by a $275,000 program of additional yard, siding and industry trackage. The Provo (Utah) yard will be rearranged and expanded to handle traffic from increased industrialization in that area. Yard facilities at Ogden are also scheduled for rearrangement.

Speed restrictions near Rifle, Colo., will be lifted by a line change which will eliminate two main track curves. Two bridges will be eliminated in a change of line near Rollinsville.

The centralized traffic control machine at Hot Sulphur Springs will be consolidated with the machine at Denver—a move that will place the Denver dispatcher in direct control of all switches and signals between Denver and Bond, 129 miles.

About $100,000 has been set aside for purchase of roadway machinery and tools. Improvements to or replacement of roadway buildings, including new section houses, accounts for another $190,000, while scheduled improvements to shop facilities, fuel stations, power plants etc., in line with dieselization will total $775,000. Expansion of the road's research and testing laboratory at Denver is also scheduled.

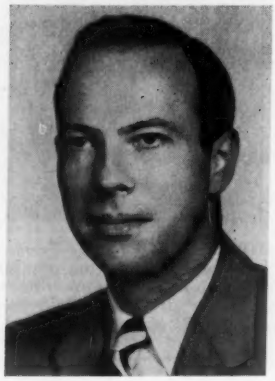
Supply Trade

P. A. Garrity, western manager of **Thomas A. Edison, Inc.,** Primary Battery division, at Chicago, has retired, and has been succeeded by **M. I. Rayner,** formerly application engineer with the division at Bloomfield, N. J.

Edwin S. McCollister has been appointed director of marketing for **ElectroData Corporation.** He has been advertising and information manager of the electronic accounting and data processing machines department of International Business Machines Corporation.

C. R. R. Harris, president and treasurer of the **Kerite Company,** has been elected chairman and chief executive officer. Theodore O. Rudd, vice-president, succeeds Mr. Harris as president. Mr. Harris will continue as treasurer.

Safety Car Heating & Lighting Co. has formed a new division for manufacture and marketing of its line of passenger car lighting fixtures, luggage racks and lighting equipment for stations and terminals. Known as the Lighting division, the new organization has been separated from the company's main operation at New Haven and has headquarters in a newly acquired plant at Milford, Conn. **Harry W. Jones, Jr.,** assistant sales manager, has been appointed manager of all operations of the new division.



Harry W. Jones, Jr.

Whiting Corporation has opened a new district sales office at Charlotte, N.C., under management of **Fred W. Fisher,** formerly sales engineer at Ardmore, Pa. Assigned to his staff is **Harvey K. Waters,** transferred from Birmingham, Ala. **T. L. Iwan,** of the Harvey, Ill., plant, has been appointed sales engineer at Ardmore

J. G. Mitchell, chief engineer and production manager, Car division, **Canadian Car & Foundry Co.,** has been appointed vice-president, manufacturing, railway car equipment. **G. L. McMillin** has been appointed assistant vice-president, steel foundry. He was formerly works manager of General Steel Castings Corporation.

J. G. Mitchell

Nicholas H. Arnold has been elected president of **Ajax Consolidated Company,** and **Albert W. Faulconbridge,** vice-president and treasurer, has been elected executive vice-president and treasurer. Mr. Arnold was formerly sales manager of **Standard Railway Equipment Manufacturing Company.** Ajax Consolidated has taken over the manufacture and sale of products of **Henry Giessel Company,** which is being liquidated. It has also been appointed exclusive railroad distributor of **Firth Sterling, Inc.,** products.

Monie S. Hudson, who for a number of years has been connected with the Taylor-Colquitt Company as research chemist, has established, at Spartanburg, S. C., his own consulting service and laboratory, specializing in problems of the wood and wood products industries.

OBITUARY

Byron S. Harvey, 78, chairman and chief executive officer of the Fred Harvey organization, died December 19 in Presbyterian Hospital, Chicago.

William W. Vosper, 79, founder of the Toledo Pipe Threading Machine Company, died December 17.

Abandonments

Authorization

CHESAPEAKE & OHIO.—To abandon a 36.6-mile segment of its main line between Baldwin, Mich., and Kaleva. The C&O was authorized to acquire trackage rights over the Manistee & Northeastern between Manistee and Kaleva, 19.9 miles, and between Onekama Junction and Onekama, three miles.

Securities

Application

PENNSYLVANIA.—To assume liability for $6,810,000 of equipment trust certificates to finance in part purchase of the following box cars and covered hoppers costing an estimated $9,095,500:

	Description and Builder	Estimated Unit Cost
392	50-foot boxcars (Pennsylvania's Altoona Shops)	$7,500
587	40-foot boxcars (Altoona Shops)	6,500
300	70-ton covered hoppers (builder to be determined through competitive bids received December 30)	7,800

The certificates, to be dated February 1, 1955, would mature in 15 annual installments of $454,000 each beginning February 1, 1956. They would be sold by competitive bidding, the interest rate to be determined by such bidding.

Dividends Declared

CAROLINA, CLINCHFIELD & OHIO.—$1.25, quarterly, payable January 20 to holders of record January 10.

ILLINOIS CENTRAL.—6% non-cumulative convertible preferred series A, 50¢, payable March 1. (Entire issue called for redemption March 1 at $57.50 per share plus this dividend. Convertible to January 31.)

NORFOLK & WESTERN.—4% adj. preferred, 25¢, quarterly, payable February 10 to holders of record January 20.

PITTSBURGH, CINCINNATI, CHICAGO & ST. LOUIS.—$2.50, semiannual, payable January 20 to holders of record January 10.

READING.—50¢, quarterly, payable February 10 to holders of record January 13.

Security Price Average

	Dec. 28	Prev. Week	Last Year
Average price of 20 representative railway stocks	85.94	85.73	57.55
Average price of 20 representative railway bonds	97.57	97.46	90.83

Financial

McGinnis Friends Claim Control of Boston & Maine

Control of the Boston & Maine seems to have been won by some members of the same group that helped Patrick B. McGinnis in his successful fight for control of the New Haven last spring. The group claims to have acquired 350,000 of the 822,379 outstanding B&M preferred and common shares.

Acquisition of the B&M reportedly is the first in a series of steps planned by Mr. McGinnis that would lead to ultimate amalgamation of the B&M, the New Haven, the Baltimore & Ohio, the Erie, and certain other railroads.

Meanwhile, Massachusetts Attorney General George Fingold, in a letter to Interstate Commerce Commission Chairman Richard F. Mitchell, said merging the B&M and New Haven would violate a federal law making it illegal for anyone to control two or more railroads except under certain conditions and with ICC approval. Mr. Fingold urged the ICC to investigate the merger proposals.

Alleghany Turns Down Request of ICC's Boyden

Alleghany Corporation has informed Roger T. Boyden, director of the Interstate Commerce Commission's Bureau of Finance, that it will not specifically ask for ICC authority to control the New York Central.

"While Alleghany always desires to satisfy your wishes it cannot do so in this case," the holding company informed Mr. Boyden in response to a request from him.

As reported in *Railway Age*, December 13, page 72, a previous similar request from Mr. Boyden was answered by an amendment to Alleghany's application for authority to acquire control of the Louisville & Jeffersonville Bridge & Railway through its merger with the Cleveland, Cincinnati, Chicago & St. Louis, both of which are Central subsidaries. This amendment included information as to the Central's

holdings, Alleghany's portfolio and a request for authority to control the L&J "while continuing its (Alleghany's) control of the Central and its other subsidiaries and for such other authority as may be deemed requisite."

The most recent filing by Alleghany, dated December 15, states that since the filing of this supplemental application, Mr. Boyden had "indicated that it does not comport with your view of the authority required by Alleghany. . ."

The letter to Mr. Boyden further states that during the Alleghany's proxy fight to gain control of the Central "the then management" of the Central sought a declaratory order which would have required Alleghany to ask permission to control the line. This petition was denied, the letter continues, and thus "reinforced Alleghany's conviction" that it did not need the authority. "Just as Alleghany required no authority to take control of the Central system," it goes on, "it requires no authority to continue" that control.

The letter further states that Alleghany would like to comply with Mr. Boyden's request but, "believing that Alleghany requires no authority to continue its control of the Central system we cannot consistently ask for such authority."

Railway Officers

ATLANTIC COAST LINE.—C. R. Lapeza, assistant to president and assistant secretary, has been appointed assistant to vice-president at Wilmington, N.C.

E. H. Cook, district superintendent at Tampa, Fla., has been appointed superintendent transportation, Northern division, at Savannah, Ga., succeeding **M. Thrash,** who has relinquished that post at his own request. **R. M. Beach** has been appointed trainmaster, Tampa district, at Lakeland, Fla., succeeding **R. L. Lightfoot,** who replaces Mr. Cook as district superintendent of the Tampa district.

BURLINGTON.—As *Railway Age* announced December 13, page 72, Carl W. Krohl has been appointed general solicitor at Chicago.

BALTIMORE & OHIO.—August W. Schell, secretary to president, has been appointed assistant to president.

CANADIAN PACIFIC.— John E. March, assistant manager, department of public relations, has been appointed manager of the department.

John L. Sugden, manager of sleeping, dining, parlor car and news service, has retired and has been succeeded by **T. P. James,** assistant manager. **N. H. Chalmers,** superintendent of the department at Montreal, has been appointed assistant manager and has been succeeded by **J. W. Moffatt,** transferred from Moose Jaw, Sask. He, in turn, has been succeeded by **D. R. Black.**

John E. March

CENTRAL OF GEORGIA.—F. C. Laing, trainmaster at Macon, Ga., has been appointed assistant superintendent of the Macon division at Albany, Ga. **T. N. Burnett** has been named assistant trainmaster at Macon.

CHESAPEAKE & OHIO.—W. M. Mountcastle, Jr., assistant general freight agent at Richmond, Va., has been appointed assistant freight traffic manager there. **T. M. Tierney** succeeds Mr. Mountcastle as assistant general freight agent.

George Roach, manager, world commerce department, at Chicago, has been transferred to New York. **Robert F. Magee,** manager at New York, has been transferred to Chicago.

CHICAGO & EASTERN ILLINOIS.— H. H. Scegraves, general agent at Dallas, Tex., has been transferred to Shreveport, La., succeeding **F. W. Powers,** whose transfer to Nashville, Tenn., was noted in *Railway Age* December 6. Mr. Scegraves' successor is **H. L. Southerland.**

The C&EI traffic office at Tulsa, Okla., is now located at 526 Kennedy building, 321 South Boston avenue.

GRAND TRUNK WESTERN.—Gordon J. Stonehouse, designing engineer—signals, who has been appointed signal engineer at Detroit *(Railway Age*, November 22, page 37).

CHICAGO GREAT WESTERN.—Sterling A. Jones has been appointed assistant general freight agent at Chicago.

CLINCHFIELD.—C. R. Harry, assistant general freight agent at Erwin, Tenn., has been appointed traffic manager there, effective January 1, succeeding **C. A. Smith,** retired. Mr. Harry has been succeeded by **C. S. Belcher. Thomas M. Peel** has been appointed general eastern agent, and **Ashley C. Wemple,** assistant general eastern agent, at New York. The position of commercial agent at Pittsburgh, formerly held by Mr. Wemple, has been abolished.

DELAWARE & HUDSON. — Joseph Rosch, general counsel at Albany, N. Y., has retired. **Donald D. Dart,** general counsel at New York, has been given sole jurisdiction over the law department.

(Continued on page 26)

GREAT NORTHERN. — As *Railway Age* announced December 20, page 43, W. P. Coliton has been appointed division superintendent at Klamath Falls, Ore.

1954's Most Memorable Transport Policy Statement

During the past year, there was no more appropriate and timely public statement made by anybody in authority on the transportation situation than the speech of Chairman Richard F. Mitchell of the ICC to the National Industrial Traffic League on November 18 (reviewed briefly in our November 29 issue). It is well to recall and bear in mind the principal points he made. Considerably abbreviated, here they are:

"Some 30 years ago the railroads of this nation had an absolute monopoly in transportation. They were a little highhanded and took advantage of their position. As a result the Congress passed certain laws in order to protect the people, and the commission interpreted those laws in the light of the prevailing situation, to wit, the monopoly of the railroads. Those laws of 30 years ago are still upon the statute books, but in that 30-year interval there has been a complete change in the transportation industry; it is now a highly competitive business. . . . Competition? I know of no field in which there is keener competition than that of transportation. . . .

"Regulation must change. The old rules are as much out of date as the horse and buggy. We in America are for the competitive system . . . but competition means equal opportunity for all. All must be regulated alike.

"Not long ago while traveling on one of the better trains from Washington to Chicago, it was my good fortune to meet and visit with a man experienced in the railroad industry and an outstanding businessman. The train was twisting, turning sharp curves, and climbing steep grades through a mountainous section of the country. As he looked out of the window this gentleman remarked that the railroads of the nation must expend huge sums in the next few years straightening their right-of-way, eliminating curves and grades, and tunneling mountains where necessary; . . . and that the eastern railroads must rebuild their yards. . . . Finally, I said . . . 'What is your idea of the cost of all these improvements?' Without a minute's hesitation he replied, 'Twenty billion dollars in rebuilding the right-of-way in the next 10 years. And,' he added, 'the railroads would also need large sums of money for better and more adequate equipment.' . . .

"You cannot compare a regulated industry with one which is not regulated. Let me give you a theoretical example. General Motors had an old plant out in Detroit where they manufactured the one-cylinder Cadillac. . . . The president of General Motors came into his office one morning at 11. It was not long before his comptroller entered with some papers in his hand and said, 'Mr. President, we are losing money operating the one-cylinder Cadillac factory building. It was built 40 years ago and our engineers, machinists and other experts tell us that it cannot be successfully operated now because it is out of date.' At one o'clock that afternoon the employees of General Motors were engaged in tearing down that one-cylinder Cadillac factory.

"In about the same year that General Motors built that one-cylinder Cadillac factory, a railroad built a branch line of approximately 70 miles out in my country, the Middle West. . . . For the last 20 years the branch line, which cost the railroad approximately the same amount of money as did the one-cylinder Cadillac factory, has been losing money, and the taxes have been increased. At the time the railroad filed an application with the commission for abandonment of that branch line, it showed a loss of over $200,000 a year in the operation. . . . A hearing was demanded and held, and the abandonment case went on for several years. . . . One week to tear down the one-cylinder Cadillac factory of the unregulated industry—three years to abandon the track of the regulated railroad.

"A short time ago the newspapers of the nation carried a story that United States Steel . . . had entered into an agreement with its hundreds of thousands of employees, granting wage increases. But, on the following day, United States Steel announced through the same newspapers that it was increasing the price of the product manufactured $3 a ton. This increase, it was explained, was necessary to cover the increased costs of the labor settlement. United States Steel had a right to do that. But suppose that United States Steel had been a regulated industry as are the trucks, the buses, the rails and the water carriers. They cannot increase the price of the product they sell —to wit, service—without first securing the consent of the Interstate Commerce Commission. The record of the past shows that it takes months, even years, to secure this consent.

"I want the regulatory laws to be the same for all the segments of the transportation industry. I advocate this for the sole reason that if regulation is changed and all branches are put under the same regulatory rules it will be possible for you, the shipper, to receive better service at a lower cost.

"According to our figures the railroads lost approximately $700 million last year in the operation of passenger trains. I do not agree with our figures. I think we have overestimated the deficit . . . so I have cut it $200 million and call it a $500 million red figure. . . . That means that each shipper of freight must pay a greater charge than would otherwise be necessary in order to cover this passenger deficit. . . .

"I would ask Congress to amend the Agriculture Exemption law so as to limit to farmers, livestock raisers, and fishermen, the private transportation of their own products. . . . How can a common carrier truck compete with these exempt haulers who are not required to publish or make public their rate charges?

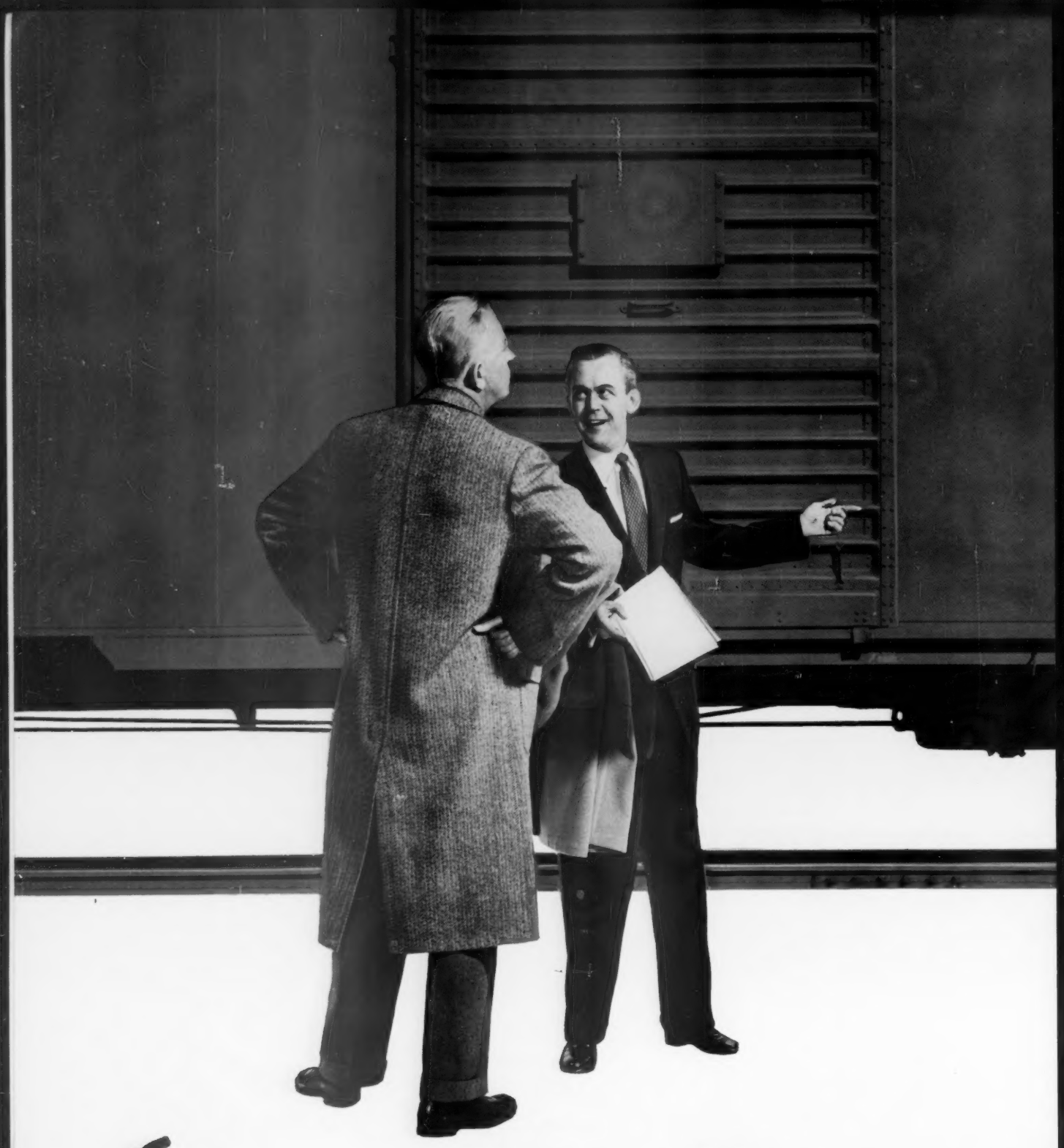
"I would advocate the repeal of Section 22. In Washington there are 46 places where you can bid for government traffic, and the traffic goes to the lowest bidder. In my opinion, there is no reason why the government of the United States, or the Defense Department, should receive a rebate or a discount from the tariff rate. It should pay the same rate as other shippers.

"I would eliminate the bulk commodity exemption which exempts from regulation the carriage of commodities in bulk when 'the cargo space of the vessel in which such commodities are transported is being used for the carrying of not more than 3 such commodities'.

"Why does the secretary of agriculture have a right to litigate orders of the Interstate Commerce Commission which are made after a hearing and in the way prescribed by law? In regulatory matters, I would limit to a great extent the participation of the regiment of lawyers of the Department of Agriculture. I would urge upon Congress the immediate repeal of the excise tax on transportation service. . . . The waybill study costs the rails and the taxpayers a lot of money and many of us doubt that it is worth what it costs. . . . It should be eliminated.

"Regulation must be so changed that the regulated transportation companies, both truck and rail, are permitted to compete with the private carrier under the same existing conditions as the private carrier is permitted to operate. . . .

"Changes in regulation should keep pace with the changes in transportation."



Shippers are "from Missouri"

Shippers don't want to hear promises about damage-free shipments. They prefer to see for themselves new rolling stock which has extra smooth rideability designed right into it. A good reason *why* their goods will be delivered in first-class condition.

Shippers don't want to hear "interesting, if true" tales about faster service. They like to see for themselves modern, streamlined equipment that will really roll along at express speeds.

And when shippers are actually shown brand-new rolling stock, then they believe... believe your railroad can deliver their goods in first-class condition, on schedule, and economically.

If *you* are from Missouri, too, why not contact your friendly **ACF** Representative. He'll *show you* how to get lower costs, damage-free shipments, fast and economical freight transportation. **ACF** Industries, Incorporated, New York · Chicago · St. Louis · Philadelphia · Washington · San Francisco · Cleveland.

ACF

CAR BUILDERS TO AMERICA'S RAILROADS

Questions and Answers FOR THE TRANSPORTATION DEPARTMENT

To what extent should a railroad adhere to a fixed budget?

•

As railroads become fully dieselized, or approach that goal, the use of diesel power is receiving increasing attention. In this column, August 2 and 30, September 27, and October 11, five roads described some of the methods they use to try to assure best utilization of motive power. And, November 22, a diesel builder's representative gave us an answer. Here's one from another railroad.—*G. C. R.*

[This is our first column for 1955. I want to take this opportunity to thank all our readers and contributors for the support our efforts have been given. I sincerely hope we are giving you what you feel you want and/or need. Your suggestions will be appreciated. Best wishes for a happy, busy and prosperous New Year. — *G. C. R.*]

CONDUCTED BY G. C. RANDALL, district manager, Car Service Division (ret.), Association of American Railroads, this column runs in alternate weekly issues of this paper, and is devoted to authoritative answers to questions on transportation department matters. Questions on subjects concerning other departments will not be considered, unless they have a direct bearing on transportation functions. Readers are invited to submit questions, and, when so inclined, letters agreeing or disagreeing with our answers. Communications should be addressed to Question and Answer Editor, *Railway Age*, 30 Church Street, New York 7.

Budget should not interfere with service.

A trainmaster writes: "It often appears that system-wide budget cuts are ordered because of traffic decreases. A particular operating division may experience little or none of this decline, but still must curtail its service, thus risking traffic losses, merely to conform to the system budget. This seems unreasonable and unrealistic. Do all roads follow this practice?"

One answer to this question was given in this column on December 20; another follows:

"We have never, in the accepted sense, adopted a budget plan of operation. I believe there are only a few railroads which have, and perhaps not many of those hew to the line to such an extent that the question of service would be involved. We place the responsibility upon department heads, in a large sense, to use their own judgement with respect to reducing or increasing forces, on the basis of availability of the business which is to be handled. We believe, all things considered, that this is, in the long run, the most desirable course to follow."—*R. C. Parsons, vice-president —operations, Louisville & Nashville.*

Pool operations utilize diesels well.

The Southern completed its dieselization program on June 17, 1953, and is now fully dieselized. Currently, the 7,875-mi system has a fleet of 887 diesel units including 684 freight and passenger units, and 203 units in switching service.

The Southern is divided into three operating districts—Eastern, Central and Western lines—each district being under supervision of a general manager.

Diesel power is pooled under supervision of the general superintendents of transportation, one for each district, each of whom is responsible for operation of the power pools in his district. There is nothing inflexible about the pooling arrangement; the pools are so set up as to afford a maximum of flexibility, both within the pools themselves and for meeting temporary needs for power beyond the capacity of any pool, division or operating district.

Maintenance responsibilities are shared by two superintendents of motive power, one at Charlotte, N. C., and one at Knoxville, Tenn.

As dieselization progressed on the Southern, studies looking toward coordination of operation and maintenance work were being made, so that when the last steam locomotive was withdrawn from service the trial-and-error period with respect to diesel operation had passed and realistic operation was an accomplished fact. Operating and maintenance officers had pooled their thinking as well as the power and had worked out a coordination of maintenance and locomotive use which would obtain maximum utilization of diesel units and at the same time have them available to permit systematic inspection, preventive maintenance and an orderly shipping procedure.

In preparing the somewhat intricate scheduling procedures it was found desirable to plot the locomotive runs on cross-section paper by day and time elements, thus providing a means of showing visually where locomotives would be in the operating cycles at a given time.

The results which were thus plotted cannot be reproduced here, but the graphic charts are kept up to date so far as possible in the various offices responsible for operation of the cycles. While space does not permit detailing many of the operating cycles, a few selected pools may be analyzed to show how high utilization is accomplished on the Southern.

Atlanta pool no. 1 is composed of 14 locomotives (28 passenger units, 2,000 hp and 2,250 hp). The operating cycle of a locomotive in this pool covers a period of 14 days. Starting from Atlanta, Ga., at 9 a.m. the first day, a locomotive runs to Washington, D. C., thence to Monroe, Va., back to Washington, thence to Atlanta, to Cincinnati and back to Atlanta, where it ties up for 15 hr 40 min. It then returns to Washington, makes a trip to Monroe and back to Washington then to Augusta, Ga., and back to Washington, then to Atlanta, Washington, Monroe, Washington, Atlanta, once more to Cincinnati, and finally back to Atlanta, where it remains 13 hr 20 min., after which the cycle begins once more.

A locomotive in this cycle covers 7,916 mi in the 14-day series of runs. It will be seen that the scheduling has provided sufficient maintenance intervals (15 hr 40 min and 13 hr 20 min); the first preventive maintenance period comes after 2,586.6 mi, after which the locomotive makes an additional 5,329 mi before it is returned to the shop.

There are six such pools operating out of Atlanta covering passenger service for the entire system. *D. W. Brosnan, vice-president — operations, Southern.*

[To be concluded in next column.]

MODERN structure serves as a combination general yard office and medical dispensary. Basic construction of building is reinforced concrete. All entrances and sidewalks around structure are protected by canopy projections.

NEW UP YARD BUILDING . . .

"Nerve Center" for a Terminal

Single-story functional structure contains general yard office, equipped with latest car accounting and communications equipment, and, in addition, houses a modern medical dispensary

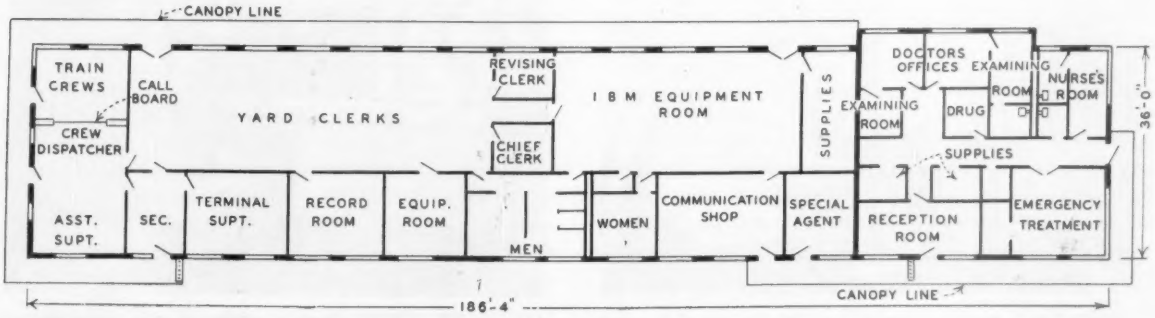
To better coordinate operations of its two train yards and two industrial yards at Kansas City, to speed handling of paper work involved in car and train movements and to provide employees with the latest in medical treatment facilities, the Union Pacific and the Union Pacific Railroad Employees Hospital Association recently erected a new single-story combination general yard office and dispensary building at that point.

The new structure is at Seventh street adjacent to the road's Armstrong yard and about 1½ miles east of the new Eighteenth street yard.* The building was erected in conjunction with construction of the latter yard, and as a part of an overall modernization of the road's facilities in the Kansas City area.

The flat-roofed building has reinforced concrete walls and floors. Beneath it is a system of tunnels for water, steam and air pipes plus electrical and communications conduits serving various parts of the building. Adjacent to the office on one side is a new asphalt-paved parking lot.

The general yard office is in the south section of the building and houses offices of the terminal superintendent, an assistant terminal superintendent, a crew dispatcher and yard clerks. In addition, one complete

*A detailed description of this yard appeared in the September 27, 1954, *Railway Age*, page 43.



FLOOR PLAN shows layout of various offices in the general yard office and arrangement of the dispensary.

In the office section of the new building . . .

YARD CLERKS in office handle paper work for all UP shipments originating, terminating or interchanged at Kansas City.

IBM EQUIPMENT room contains latest in accounting machines for reporting and recording all the required car-movement data.

room is devoted to accounting equipment. The general office is connected to each of the other Kansas City terminal facilities by Motorola radio and "intercom," and to other points on the UP system by Teletype over which train consists and other car information is transmitted.

An extensive pneumatic tube system, consisting of four separate transmission tubes, connects the new office with specific yard locations where incoming eastbound, outgoing westbound, incoming transfer and outgoing transfer waybills, respectively, are handled. The four lines converge from their various directions near the new building and are carried overhead into the structure above surrounding obstructions on a row of steel bents.

In the IBM room up-to-date equipment for reporting and recording car information has been installed. No written car information is handled in this office aside from the original waybills on each shipment, and even these are photographed and recorded on microfilm. All of the waybill information, train numbers, times, dates, etc., are key-punched into cards, after which the information is assimilated and recorded by the various machines, thence transmitted to other strategic points on the UP system by Teletype directly from these punched cards.

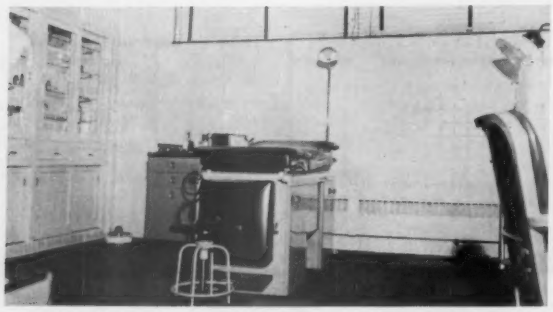
In the crew dispatcher's office, where all switch, freight and passenger crews as well as train baggagemen are dispatched, a novel type call board has been installed. This consists of a series of slotted openings into which are placed small wooden blocks, each with a man's name on the end. Movement of the blocks to various locations around the board indicates what crew each man is scheduled for. The names and crew members are also visible from the crew room on the opposite side of the board. The block system replaces the old-type blackboard on which crew members were marked up with chalk, and is reported to work quite satisfactorily.

Radio Repair Shop

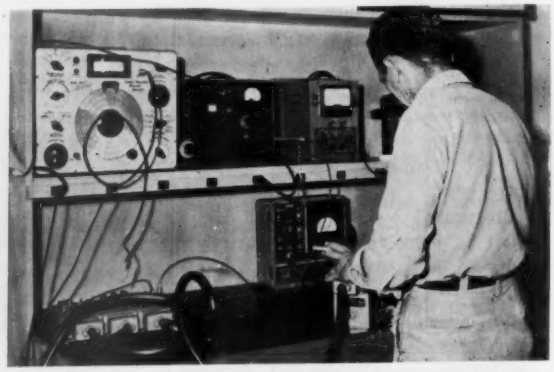
Also in the south section of the building are the office of the special agent and a radio repair shop which serves as the communications office in Kansas City. All of the south section of the building is air conditioned by a 25-ton unit installed in the equipment room. Also in the equipment room are four air compressors which supply air for operating the pneumatic tube system. The building is heated by wall-finned radiators mounted near the floor at intervals around each room.

The general yard office section has vinyl tile floors except in the rest rooms where quarry tile has been used. Interior walls are plastered over steel lath and in the rest rooms are finished with a wainscot of plastic tile.

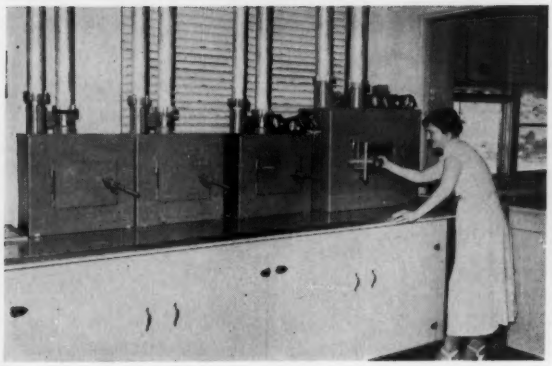
Other facilities . . .



EMERGENCY treatment room has latest in examining and surgical equipment, non-conductive floors and tile walls.



COMMUNICATIONS shop is equipped with parts storage lockers and benches where repairs to equipment are made.



PNEUMATIC tube station in yard office has four two-way lines connecting with each of the strategic locations in train-yard area.

RADIO and "intercom" connect assistant superintendent's office with four yards, 28 switch engines and three automobiles.

Ceilings are covered with acoustical tile, and lighting is furnished by rows of hanging-type fluorescent fixtures. Both inside and outside doors throughout the building are natural-finished wood.

Modern Medical Facilities

The dispensary portion of the building in the north end comprises a reception room, two doctor's offices, two examining rooms, an emergency treatment room, a drug prescription room, a drug storage room, a stationery supply room, a nurse's room, and three rest rooms. The area is laid out with a corridor leading from the reception room, off of which each of the other rooms is situated. Floors in the corridor are of vinyl tile, as are those in the offices and reception room. Floors in the drug room are ceramic tile because of the chemicals handled there, while those in the emergency treatment room are of a non-conductive tile to eliminate the danger of static electricity where explosive gases are used.

In the emergency treatment room lighting is provided by four operating room-type fixtures which are recessed into the ceiling and furnish a concentrated beam on the examining table. The remainder of the dispensary is lighted by fluorescent fixtures like those used elsewhere in the building. An individual 7½-ton air-conditioning unit has been installed to cool the dispensary area, while heating is supplied by wall-finned radiators on the same system as those in the yard office.

Up-to-Date Dispensary

The dispensary is equipped with the latest in modern examining and surgical equipment, all of which was purchased new for the building. Treatment rendered at the dispensary is essentially the same as that which is carried out in a doctor's office. Minor surgical procedures are performed, and electrocardiographic examinations are made. Medications are dispensed by physicians who are in attendance at the dispensary daily to see employees as they come in for care. A nurse on duty during the day cares for minor wounds and dressings and gives emergency treatment pending the arrival of a doctor.

Officers report that the dispensary is of great convenience to both employees and doctors. It saves the employee from having to make trips to doctors' offices or hospitals in the congested midtown areas. It also saves a large volume of work in the doctors' personal offices.

CALL BOARD is of novel design with slotted openings into which are placed wood blocks with men's names on each end.

All UP employees in or around the Kansas City area are entitled to treatment at the dispensary for personal illness and on- or off-duty injuries. The dispensary portion of the building was built and is operated by the Union Pacific Railroad Employees Hospital Association which is supported by contributions from each employee, deducted from his payroll check. The railroad reimburses the association on a predetermined percentage basis for the care of on-duty injuries to employees.

A full complement of medical specialists in every field of medicine, as well as general practitioners, are on the association staff at Kansas City. This staff is headed by a district surgeon who maintains an office at the dispensary where administration functions of the association are handled for the states of Kansas and Missouri.

Design and construction of the general yard office-dispensary building was carried out under the general direction of W. C. Perkins, chief engineer. Operations of the UP's Kansas City terminal are under the supervision of T. P. Argubright, terminal superintendent. The dispensary is under the direction of Dr. Graham J. Owens, district surgeon of the Union Pacific Railroad Employees Hospital Association.

RECTIFIER type locomotives such as this may be an important factor in reestablishing electric operation.

If present trends in traffic requirements, fuel prices, maintenance costs and engineering developments continue, there will be . . .

More Electrification in 10 Years

. . . Says **L. B. CURTIS***
Assistant Engineer
Pennsylvania

Since 1938, railroad electrification in this country has not been extended—in fact, in a few cases, small electrifications have been abandoned as a result of the use of diesel-electric locomotives for through operation, and in a very few cases for other good and sufficient reasons.

This situation has caused the idea to grow in some minds that electrification is an obsolete form of transportation quietly awaiting its formal burial. This is definitely not the true picture. In this country, existing major electrifications are still maintaining their record of dependability and economy, while abroad electrification of railroads is growing by leaps and bounds.

There are many factors to indicate that in the United States railroad electrification will again become a major project. This is not a prediction that electrification will completely replace other types of motive power. On main-line and branch-line tracks where traffic is too light to justify electrification, in most yards except for reach-ins, and for side tracks, electrification will be supplemented by other modes of motive power.

Here are some of the evidences of the coming resurgence of electrification in this country.

1. In the near future there will be a trend towards more and more freight and passenger trains that will be faster and more frequent. This is already the situation abroad. In this country, freight and passenger trains have become longer and longer in order to reduce costs, mainly labor cost. This has resulted in fewer trains, more costly yards, terminals, and stations, delays in delivery, and a mounting chorus of complaints on the part of the public.

Specifically, these longer trains have the following drawbacks:

In Freight Service:

- Freight terminals in general are not adapted for long trains on one track. Rebuilding present yards and building new ones to accommodate these long trains is very costly.
- It takes longer to assemble these long trains.
- It takes longer to classify these long trains received from the road so that the individual cars can be delivered to their destination.
- There is a greater problem of maintaining brake pipe pressures.
- It is more difficult to remove shop cars from trains for repairs.
- It takes longer to inspect the equipment in yards.
- It is more difficult and costly to maintain air lines in yards.
- Train handling is much more difficult. Frequent damage occurs to the equipment and the lading due to slack action and problems are involved in starting and stopping long trains.
- When road detentions occur they are of considerably longer duration due to the time involved in the crew walking from cabin car or from engine over the train to make inspections, again walking to telephone to make reports, and then perhaps carrying parts such as a knuckle or an air hose to replace a failed part.

In Passenger Service:

- Platforms are not built to accommodate these long trains. It is sometimes necessary to make two stops at the same station.

*The thoughts expressed in this article are the author's and do not necessarily represent those of the Pennsylvania or Committee 13, Railway Electrification, of the Association of American Railroads. The article is written to stimulate interest and discussion, and should not be interpreted as representing the present policy of the Pennsylvania.

- At stub-end stations passengers must walk long distances with heavy luggage to reach the waiting room.
- Terminal yards have not been equipped to handle these long trains.
- It is costly to maintain the steam and air lines in yards and also to maintain the pressure.
- It is more difficult and costly to organize the personnel in yards to clean and maintain the passenger equipment.
- In winter it is difficult to heat the entire length of a train.
- There is a problem in dining car service—passengers must walk through many cars and often wait long periods for service.

The railroads' competitors operate more frequent service in smaller units, and usually faster overall. Railroads must meet this competition to get their fair share of the business. Labor must cooperate to survive. With fewer men operating each train, the total employment may not change with more trains to meet the need.

The more trains operating and spread over the 24 hours of the day, the better will be the load factor with electric service. The better the load factor, the more economically justified is railroad electrification.

2. As diesel-electric locomotives become older, maintenance costs will probably increase faster than similar maintenance on electric locomotives.

Until railroads are 100 per cent dieselized, or have completed their diesel programs, diesel maintenance costs will be misleading because the maintenance of new locomotives is averaged in with the older ones. In general, diesel-electric locomotives receive major overhauling in approximately three-year cycles, with this rhythmic cost curve rising until, after about 20 years, the old locomotive essentially has been replaced.

Messrs. Brown and Kimball, in an AIEE technical paper last year,* showed in graph form that "the general trends indicate that diesel-electric maintenance, reduced to the same common denominator, will be for locomotives 10 years of age at least twice the maintenance costs of electric locomotives."

While the 20-year life of the diesel-electric locomotive assumed by Messrs. Brown and Kimball may or may not be substantiated, the lower maintenance of the straight electric locomotive compared with the diesel-electric is already proved.

3. Indications are that the cost of oil will increase.

The Battelle Memorial Institute of Columbus, Ohio, was selected by the Supervisory Committee of the Joint Committee on Railroad Electrification representing railroads, electric utilities, electric manufacturers, and coal producers, among other things to make a survey on the outlook for the supply and the cost of fuel, coal, diesel oil, and electricity for the period 1950-1970. The study's conclusions follow:

"The fuel outlook for the next 20 years, assuming conditions of peace, is for ample supplies of coal and probably ample supplies of liquid fuels, although, toward 1970, coal and oil shale, rather than petroleum, may be the primary raw materials for liquid fuels.

"Under wartime conditions, the supply of all liquid fuels for the domestic economy will be extremely tight and the quality of diesel fuels for railroad use probably will deteriorate.

"By 1970 . . . diesel-fuel costs are expected to increase by possibly 25 to 50 per cent."

Frank R. Markley, vice-president in charge of marketing of the Sun Oil Company, on September 25, 1953, said, "But oil is after all, an extractive industry; a field once found means one less field remaining to be found. So in order to increase their output and, at the same time, build up their reserves, production men in the oil fields have had to search harder and drill deeper. This inevitably has led to increased costs.

"As long as we can afford the increase in costs of oil production, I am confident that we shall continue to find oil. It is my considered judgment based on 33 years experience that this country will never run out of oil in the sense that it ever becomes physically impossible to find and produce it. Before that can happen, assuming we maintain a free enterprise economy, substitutes for petroleum will become commercially feasible and will be developed.

"The interesting thing about the possible development of other energy sources is the ceiling those possibilities impose upon petroleum prices. The so-called Paley report of the President's Materials Policy Commission last year took cognizance of this, when it stated that competitive sources of liquid fuel, both synthetic and foreign, can be expected to keep domestic crude oil prices from rising more than 25 or 30 per cent over the next 25 years."

Higher oil costs mean higher operating costs of diesel-electric locomotives.

4. Indications are that the cost of electricity after the present period of adjustment will decrease or remain about the same.

The same Batelle Memorial Institute report indicated that "by 1970, electric-power costs in terms of the 1950 dollar will be possibly as much as 10 per cent below present levels."

W. H. Sammis, president of the Edison Electric Institute, recently said:

"Our industry has established a unique record during this era of inflation when the purchasing power of the dollar has dropped 50 per cent, when construction costs, federal taxes, labor rates, and the price of fuels have more than doubled. Through engineering achievements, improvements in operations, and well directed sales efforts, prices for electricity are lower today than they were before World War II. Where can you find another such example of accomplishment?"

The Winter 1954 issue of Our Sun, published by the Sun Oil Company, states that "if the government sold natural-uranium fuel rods at $35 per pound (considered a reasonable price) electrical power could be generated for a fuel cost of 1.3 mills per kilowatt-hour. This compares with present fuel costs from other sources of energy of 3.0 mills per kilowatt-hour."

Francis McCune, general manager of General Electric Company's Atomic Products Division says in the July 1954, General Electric Review: "First, we at General Electric believe that electric utility companies will be owning and operating a number of atomic power plants within the next 10 years. Second, we believe some of these will be full-scale and, what is most important, they will generate electricity at competitive costs,—possibly within five, certainly within 10 years."

General Electric studies indicate a reactor could produce electricity for 6.7 mills per kilowatt-hour, compared to a cost of 6.9 mills for a conventional coal-

* "What Price Diesel Maintenance?", *Railway Age*, February 8, 1954, page 68.

burning plant. Plants chosen for comparison would each deliver 300,000 net kw of electricity.

Developments such as the use of atomic power in central power generating plants, the further use of water power together with higher voltage transmission lines, and the greater number of system tie-ins will all tend to maintain the cost of electricity at present or lower rates.

The greater the differential between the cost of central generating power per kw-hr, and that generated on the locomotive, the greater the advantage of electrification.

5. Standardization of electrification will reduce engineering costs, material costs, construction costs, and locomotive and multiple-unit car costs.

In this country, as well as abroad, there are many types and kinds of electrification based upon voltage and frequency. AAR Committee 13, Railway Electrification, is working on the terrific problem of trying to arrive at a single standard voltage and frequency for this country, that will result in the best performance as to efficiency, dependability, and economy. This study is being made without being bound by any existing installations or preconceived ideas. When the answer is ready, great economies will result as follows:

a. Engineering costs. With a standard pattern for extensions to existing electrifications and new ones, standardization will be possible for structures, catenary systems, substations, locomotives, etc. Basic engineering will have to be performed regarding foundation and pole sizes, spans, catenary make-up, and spacing and details of substations. For similar conditions of load, track curvature, number of tracks, and length of track to be electrified on any railroad, the same design will apply. Therefore, except for specific application and special problems, the engineering costs after the first study will be at an absolute minimum.

b. Material costs. After the initial engineering has determined pole sizes, wire sizes, hardware, apparatus sizes, and other standard parts, these same items can be used on any electrification interchangeably. With all railroads using the same type of material, quantity buying will reduce first costs and also cost and amount of material to be stocked for maintenance. This should stimulate manufacturers to develop better and lower cost materials and apparatus.

c. Construction costs. With a standard specification, standard methods of construction will be developed, labor saving devices employed, and packaged substations such as the unit type sold, all of which will reduce the cost of installation.

d. Locomotive and M-U car costs. Nothing reduces first cost more than mass production. In the past, electric locomotives have been almost custom made. When standard universal road type and yard switcher type electric locomotives are accepted and used by all railroads, quantity production will greatly reduce both the first cost of motive power and maintenance costs. The same reasoning applies to multiple-unit cars.

This standardization will greatly reduce both first cost of electrification and also maintenance costs, making electrification even more attractive compared with other types of motive power.

6. The use of commercial frequency with a 24-kv or even higher voltage trolley will also aid in reducing electrification costs.

In Europe at the present time considerable experimenting is going on with the use of 25-kv, 50-cycle commercial frequency electrification. In this country the corresponding system would be 24-kv, 60-cycle. Voltages as high as 48 kv have already received serious study. The possibilities of savings over existing forms of electrification follow:

a. Where commercial transmission lines are available, and they are becoming increasingly available, they can be directly tapped for power supply to the catenary system, thus eliminating the necessity for railroad-owned lines on railroad structures. This procedure would have to be developed between the power companies and the railroads keeping in mind the total load requirements.

b. At higher voltages a lighter catenary system is possible.

c. With (a) and (b) the foundations and structures will be smaller and lighter.

d. At higher voltages substations or sectionalizing stations can be installed farther apart.

e. Transformer stations can be wholly or partly eliminated, depending upon commercial voltage available.

f. With a higher voltage the current will be lower, thus reducing the ampere rating of substation apparatus.

g. Frequency changers at supply stations are eliminated.

h. By using rectifier or motor-generator locomotives, rectifier and rotary converter substations are eliminated.

i. Diesel-electric locomotives can, where economically advisable, be converted to straight electric locomotives by replacing the diesel engine and the d-c generator with rectifiers or the diesel engine alone with an a-c motor.

These savings are offset in part by the following additional costs of this system:

a. Greater clearances are required.

b. Increased insulation is necessary over some existing forms of electrification on overhead, substation apparatus, and motive power.

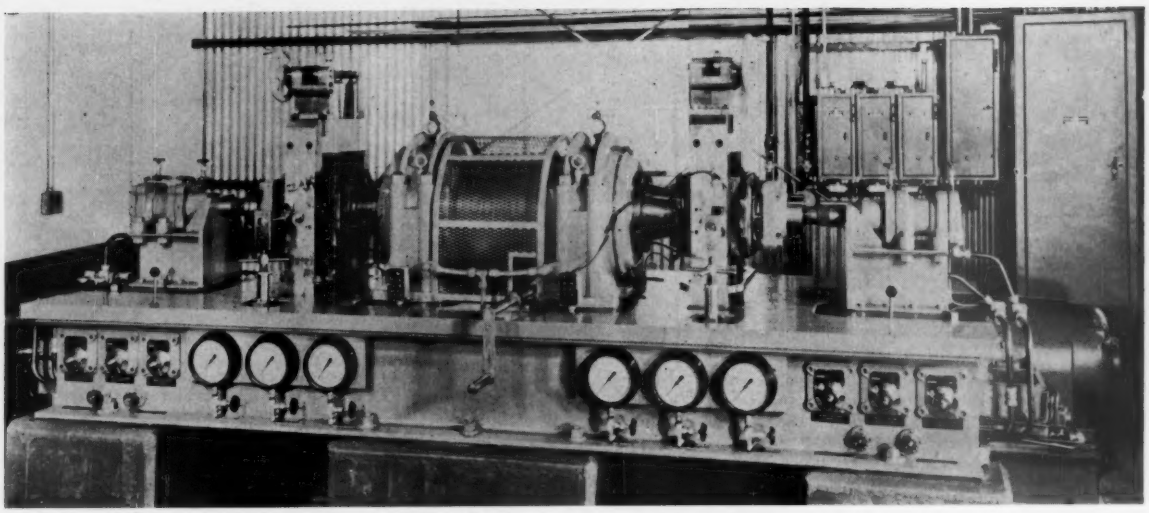
c. There is the possibility of additional load-balancing apparatus to maintain balance on commercial three-phase systems.

d. There will be some additional engineering required initially in developing this system.

From the various studies that have been made, it seems evident that the net result of this system will be savings over all existing systems, thus adding another inducement to electrification.

* * *

All of these evidences point toward a more and more favorable economic position of electrification compared with other forms of motive power. Therefore, it is with confidence that this article is written, and a prediction made that within 10 years electrification will again be on the march in this country, unless war or an act of God brings it much sooner. Electrification should be the answer to many existing problems and some of the newer ones that are bound to come.



SEVEN-TON, full-scale journal-bearing test machine showing two actual 5½ by 10 in. journal boxes assembled with vertical loading yokes and axial load cylinders.

PROGRESS ***HAS*** BEEN MADE IN . . .

Railroad Bearing Lubrication

Since bearings are an integral part of almost every machine, proper functioning of the machine depends materially upon the proper functioning of the bearings. In addition to bearing design and construction, the lubricant used plays a significant role in the performance of the bearing, and in turn, of the machine itself.

Most bearings are used for support of rotating shafts or journals. On American railroads alone, there are actually millions of such bearings employed as locomotive and car journal bearings. As in other machinery, the proper functioning of this rolling stock is dependent upon bearing performance.

Railroad Growth

Great progress in the design and construction of railway equipment accompanied the physical expansion of the railroads. Not only were advances made in comfort and safety to the traveler, but improvements were realized to increase efficiency and reliability of all rolling stock. This progress has made possible the utilization of the greater motive power as locomotive design advanced and trains became larger and faster.

Progress has also been realized in the field of lubricants and lubrication. As a result of research and testing, improved petroleum products have been developed to keep pace with the demands and oftentimes open the way for equipment and performance advances.

Maintenance Costs

A very important consideration in railroad operation is the cost of equipment maintenance. As shown in the tabulations, the cost of freight and passenger car maintenance has risen rapidly from 1940 to 1952. Increased hourly labor costs have greatly affected this expense.

In addition, the number of available maintenance hours has been drastically reduced, with fewer employees working shorter hours. Car box maintenance is an ap-

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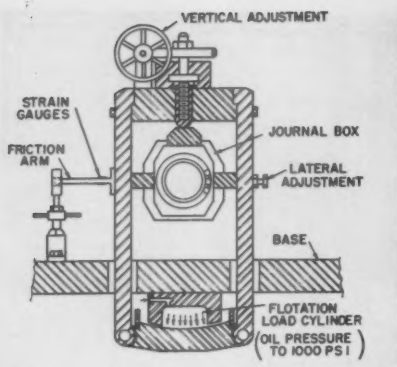
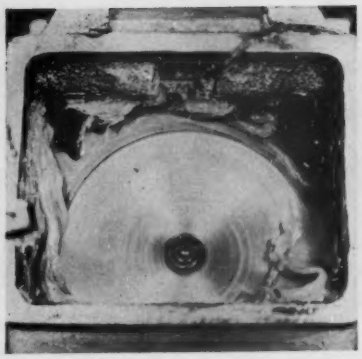
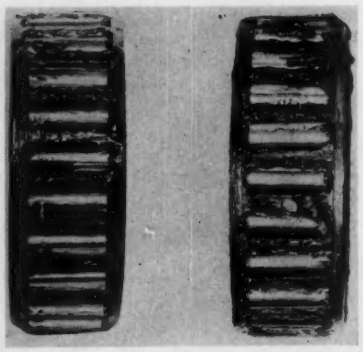
During the history of railroading, even from the early days of the wood-burning steam locomotive, the operating requirements of railroad journal bearings have become increasingly severe. The challenge in this field has been continuously met and the railroads, their associated organizations, bearing manufacturers, the lubricant suppliers, through research and development have made many advances in the field of bearing lubrication. It is certain that their continued efforts will result in even greater achievements.

Every once in a while a good discussion of these advances is made available. Such a paper, by F. J. Villforth and J. R. Muenger, was featured in the Texas Company publication, Lubrication. Because of its value, it has been highlighted in the following pages and the full text appears in the January *Railway Locomotives and Car*—Editor.







SCHEMATIC section (left) through a roller bearing journal box of test machine showing vertical loading yoke and flotation to permit bearing friction measurement. CENTER—A plain journal box being run in the laboratory under load with grease lubrication. Considerable circulation of the grease to the bearing can be seen as a result of axle rotation. RIGHT—Two roller and cage assemblies at completion of simulated service run on test machine. Amount and condition of grease shows differences in performance of greases "A" (left) and "B" (right).

preciable part of the total maintenance and is subject to these same limitations.

Both the increased operating demands and the trend in maintenance economics place a premium on continued improvements in bearing design, lubricants and lubrication practices. It is the job of research to produce these improvements. It can be seen that even small improvements will result in large overall benefits with more than 1,745,000 freight and 37,000 passenger cars in service.

Journal Bearing Test Machine

Over many years of studying bearing lubrication and investigating lubrication problems, numerous test machines have been constructed and operated in the laboratories of the Texas Company. All of these tests have served the purpose of coming to a better understanding of the problems and have ultimately resulted in more and better lubricants.

The railroad journal-bearing test machine is one of the significant achievements in realizing the dream of the laboratory to have a bearing test machine on which full-scale journal boxes could be subjected to the load and speed conditions encountered on the actual railroad right-of-way.

Steady vertical loads which correspond to the dead weight and lading of the car can be applied to the test bearing up to a maximum of 50,000 lb. In addition, vertical shock loads can be superimposed on the steady load to simulate the bearing loading experienced as a result of passing over rail partings, frogs, etc. Horizontal or axial loading, both steady and shock, duplicate the bearing loading resulting when cars are maneuvering on curves or passing crossovers. Maximum steady axial loads of 15,000 lb are possible.

Through the machine, shock loading frequencies may be varied up to 400 cycles per minute to correspond to the simulated speed of the car. The axial loading system provides for the relative axial motion inherent in certain types and designs of boxes. Journal rotation may be varied over the range of speeds up to the equivalent of 100 mph train speed.

The tester accommodates two full size journal boxes, one at either end of the journal. The main shaft is supported on two pedestal bearings located on either side of the V-belt drive in the center of the machine. The vertical loading is applied through the loading yoke around each journal box. The double-acting piston-cylinder assemblies at each end supply the axial loading.

All loading is applied by hydraulic pressure up to a maximum of 1,000 psi. For vertical loading, oil is supplied to the flotation load cylinder. The pressure acts against the mating loading shoe and by means of the yoke is transmitted to the top of the journal box. The machine is driven by a 75-hp motor which is coupled through a variable speed hydraulic coupling to a two-speed transmission which drives the main shaft of the machine through ten V-belts. Emergency safety provisions include automatic shut-down for bearing overload, bearing load failure, and test or support bearing overheating.

Lubrication of Roller Bearing Journal Boxes

The application of roller bearings on railway rolling stock is not new; the first installations were made in the early 1900's. Although some of these early installations experienced problems, the performance of many were quite satisfactory and served to establish roller bearings as an important part of railroad operating equipment.

With increased speeds of operation and concern for passenger comfort, it was quite natural that these bearings should first be applied in that type of service. With the diesel-electric locomotive, roller bearings were used

YEARLY CAR MAINTENANCE—COST OF REPAIRS, CLASS I RAILROADS

Year	Dollars Per Car		Ratio of Car Repairs to Operating Revenue, Per Cent
	Freight	Passenger	
1940	116	1782	6.09
1942	171	2357	5.27
1944	206	3440	5.29
1946	212	3750	6.79
1948	256	4768	7.34
1950	278	4532	6.90

Statistics from Moody's Transportation, 1953

almost exclusively from the start. Although the application to freight rolling stock has not been very general, some cars are being equipped with roller bearings.

The fact that roller bearings often operate for long periods without attention, and even with very thin coatings of lubricants on the parts, frequently leads to the erroneous conception that the roller bearing needs no lubrication or its lubrication is relatively unimportant. Some confusion is added to the overall picture because these bearings may operate at a higher temperature and have somewhat higher friction when lubricated.

Lubrication of a roller bearing serves the following functions:

- Providing a film to lubricate the sliding contact areas between the rolling elements and their retainers.
- Providing protection for the highly finished, accurately ground surfaces against rust and corrosion.
- Assisting in the formation of a seal against the entrance of dirt or other foreign matter.
- Cushioning the shock and distributing the load as the rolling elements enter the loaded zone.
- Aiding the dissipation of heat.

The accurate dimensions and fine surface finishes required for satisfactory operation of roller bearings can easily be destroyed if the proper lubricant is not used. Lubricant selection should be based upon bearing operating conditions such as load, speed and temperature. However, such factors as bearing housing design, accessibility for relubrication, and possibilities for contamination by moisture and foreign matter have an important influence on the lubricant choice.

In general, it has been the practice to use as light a lubricant as can be successfully retained in the bearing. Both car oils and greases are being used to lubricate roller bearings of car boxes. However, the present tendency is toward more widespread use of grease.

In spite of the higher cost of grease over car oil, the longer service life and less required makeup give an overall economy with the grease. Grease has the advantage over oil in serving as a better seal to prevent the entrance of foreign matter. It is also more easily retained in the journal box. In railway service, the desirable goal is to renew the lubricant only at wheel turnings and wheel renewals.

Plain Journal Box Lubrication

In spite of the replacement of plain bearings on passenger cars and locomotives, and in some freight service, it is estimated that there are more than 14,000,000 solid type journal boxes on freight cars alone on American railroads.

The bearings, in general, are fabricated as cylindrical segments of material different from the axle or journal with which they operate. A common bearing material is brass with a babbitt lining which provides conformability with the journal. The wedge serves to distribute the load and to seat the bearing properly.

In most installations, oil is fed to the journal from the oil reservoir in the bottom of the journal box by the capillary action of a cotton waste packing. In most cases, packing retainers are used to help maintain the waste in position during switching and "humping" operations.

EMPLOYEES AND PAYROLL FOR MAINTENANCE OF EQUIPMENT, CLASS I RAILROADS

Year	No. of Employees	Payroll
1940	280,719	$ 493,430,770
1942	350,347	762,740,557
1944	389,176	1,048,834,257
1946	371,150	1,104,229,042
1948	365,142	1,264,536,859
1950	348,181	1,211,043,941
1952	345,531	1,366,855,258

Statistics from Moody's Transportation, 1953

When operating with a sufficient supply of lubricant, the bearing will be completely separated from the journal by a wedge-shaped, load-supporting oil film. Under such conditions, bearing friction is due mainly to the fluid friction resulting from the viscosity of the oil in the clearance space.

Due to the frictional heat developed, bearings operate at temperatures higher than the ambient. This frictional heat dissipates into the journal and bearing, and the greater the friction, the greater the differential between the bearing and the ambient temperature. To a considerable degree, this temperature rise is indicative of the efficiency of the lubrication.

When more heat is generated in a journal box than can be dissipated, a bearing failure ultimately results. In the waste-packed bearing, the friction of the packing against the journal as well as the oil film friction is a source of heat. The packing friction and also the feeding of the oil are functions of the type and size of threads in the packing and the oil viscosity. By varying these, it is possible to exert some control over the packing friction. Low viscosity oils are reported to produce less packing friction, carry less lint and foreign matter to the bearing, and feed more oil to the journal.

Hot Boxes

The failure of the bearing to function properly results in overheating, which in railroad circles has become known as the "hot box." The occurrence of a hot box is serious because it requires setting out the car from the train for bearing repair or replacement. Car-miles per hot-box set-off vary considerably depending on the season and the particular railroad involved. Some roads have a disproportionate number of these failures because of contaminating material being hauled, short-haul traffic, etc. If hot boxes are not detected sufficiently early they can lead to more serious damage to the bearing and axle and even result in train accidents.

The incidence of hot boxes is very closely related to seasonal variations in temperature, particularly during extreme temperature conditions. The lower oil viscosity resulting from hot weather probably affects the bearing to reduce the minimum film thicknesses. In low temperatures the tendency for waste roll and grab is much greater because of the increased viscosity of the oil.

The occurrence of hot boxes following closely after the repacking of journal boxes and the installation of new brasses has been observed. If distress is going to occur from this source, experience has shown that it

most often happens within a few miles or a short time after leaving the terminal.

Because of poor or improperly seated seals, foreign matter such as dirt, snow, rain and other undesirable materials find their way into the journal boxes where they contaminate the lubricant and may cause changes in its properties.

Inspection and preventive maintenance have become more difficult since today trains are assembled and depart much more rapidly. The less frequent and shorter stops of the modern train do not provide sufficient time or occasion for the thorough inspections and servicing customary in the past. Much more rapid interchanging of cars and shorter periods of time in which the cars are on the same road are also making maintenance programs difficult to schedule.

With the rapid accelerations now possible with the high powered diesel-electric, bearing wear-in periods are not as gradual and there is less time for the bearing to make adjustments for abnormal conditions. Also with rapid acceleration there may be insufficient time for the establishment of an adequate lubricant film. Consequently, under these conditions high friction will occur and high temperatures will develop.

Because of the constantly increasing maintenance costs and the continued interest in improving railroad service and effecting economies in operation, a much greater emphasis is being given to hot boxes. Bearing manufacturers, railroads and lubricant suppliers are studying the problem and making concerted efforts to achieve a satisfactory solution.

Progress has been realized in all fields of endeavor. Improvements have been made in bearing materials, in bearing design, and in finishing and dimensioning of the various elements. Concern for the type of packing has led to better selection of material used in the waste as well as improved methods for handling and reclaiming it.

Designs have been suggested which substitute other types of oilers for that commonly used. Various mechanical devices such as waste retainers have been devised to overcome the shortcomings of waste packings. Several rather radically new bearing designs, at least for railway service, are being suggested. They provide much more accurate fitting of journal and bearing with more positive lubricant supply mechanisms. A number of these are under test either in laboratories or on the roads. It is inevitable that some of these will result in improvements in the reliability of this already tried and proven mechanism.

Grease Lubrication of Plain Bearings

Many investigators concerned with the hot box problem consider that the elimination of the waste packing is essential to a completely satisfactory and reliable plain bearing for railroad service. In the past several years this approach has been evidenced by numerous papers published in technical journals and presented to technical societies. The rather fundamental studies which were conducted on the previously mentioned bearing test machines, with grease as a lubricant, suggested the feasibility of grease for the lubrication of plain car boxes. In particular, these studies showed that a hydrodynamic load-supporting film was developed with grease in much the same manner as for a fluid type lubricant and the coefficients of friction were of the same order of magnitude.

The principles observed in the experimental bearing have been applied to the full size car journal box on the railroad journal bearing tester. Grease was charged in the box to a level sufficient for the journal to dip into and pick up grease and carry it into the clearance space. The investigations, which are continuing, show the influence of grease fluidity on the circulation of the grease in the box. Experimental work shows some of the factors, both in the bearing and grease properties, which can be varied to influence the bearing performance.

Through continued research and development in this field of bearing lubrication, it is certain even greater progress and achievements will be realized within the near future.

Railway Officers

(Continued from page 12)

KANSAS CITY SOUTHERN. — **E. J. Biagioli** and **E. O. Sikes** have been appointed general agents at Texarkana, Tex., and Dallas, respectively.

MEXICAN RAILWAY.—Feliciano M. Prado has been appointed assistant general manager at Mexico City, Mex., succeeding **Victor G. Pina. Federico Fischer I,** engineer, has been appointed general chief clerk, succeeding **Amando Beltran.**

NEW YORK CENTRAL.—Wallace M. Snow, assistant general freight agent at New York, has been appointed freight traffic manager at Boston, succeeding **Robert G. Henderson,** retired. **Walter L. Wheat,** general freight agent at Boston, will succeed **Frank E. McGrath,** retired, as assistant freight traffic manager there, and **John G. Patten** has been appointed general freight agent. **G. W. Blaser,** assistant general eastern freight agent at New York, has retired. **Philip L. Gilmer** has been appointed general agent, freight department, at Watertown, N. Y., succeeding **H. J. French,** retired.

S. A. McNichol has been named trainmaster-general yardmaster Grand Central Terminal, succeeding **W. A. Withall,** retired.

Dan A. Kubelsky has been appointed assistant chief industrial engineer. He was formerly with Electro-Motive Division of General Motors Corporation as a general supervisor.

NORFOLK & WESTERN.—H. C. White, commercial agent at Bristol, Va., has been promoted to general agent there, succeeding the late **R. B. Torbett.**

PITTSBURGH & WEST VIRGINIA. — **R. W. Bramwell,** vice-president, traffic, has been elected vice-president and assistant to president. **Albert H. Graham,** general traffic manager, has been elected assistant vice-president and treasurer. In addition to financial duties, he will continue in charge of rates and divisions. **Charles A. Thoma,** traffic manager, has been appointed assistant vice-president, sales. **E. J. Siemon, Jr.,** assistant general freight agent, rates and divisions, has been appointed assistant to assistant vice-president at Pittsburgh. **R. E. Manning** has been named western traffic manager at Chicago, and **W. B. Harahan, Jr.,** eastern traffic manager at New York.

PENNSYLVANIA. — **George C. Vaughan,** superintendent of the Maryland division at Baltimore, has been advanced to assistant general manager, Central region, at Pitts-

PENNSYLVANIA.—W. Parker Stuart, coal traffic manager (sales) at Philadelphia, who has been appointed general coal traffic manager with system-wide jurisdiction *(Railway Age*, December 13, page 74).

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burgh. He has been succeeded by **H. H. Vaughn,** transferred from the Fort Wayne, division, where he has been succeeded as superintendent by **George R. Weaver,** assistant manager. Altoona works.

W. Llewellyn Milar, Jr., personnel manager, dining car department, at Long Island City, N. Y., has been named superintendent dining car service at Chicago, succeeding **Jay P. Fehr,** retired.

Walter L. Newberrey, foreign freight agent at New York, and **Clarence C. Tinney,** district freight agent at Newark, N. J., have retired.

READING.—Birkett Howarth, assistant secretary and assistant treasurer at Philadelphia, has been elected secretary and treasurer, effective December 1, succeeding **William W. Rhoads,** vice-president, secretary and

Birkett Howarth

treasurer, who remained as a vice-president until he retired December 31, after more than 48 years of railroad service.

Allen Lesley, attorney in the office of vice-president and general counsel, has been promoted to assistant general solicitor.

George B. Blatt, superintendent telegraph and signals at Philadelphia, has been named chief signal, electrical and communications engineer. The position of superintendent telegraph and signals has been abolished.

George B. Blatt

G. J. Young, chief clerk to general manager, has been appointed assistant to general manager at Reading, Pa., succeeding **Roy H. Seidel,** who retired November 1, after 44 years of service.

SEABOARD.—William J. Hock, assistant to vice-president—freight traffic, has been appointed system freight traffic manager in charge of solicitation and service, at Norfolk, Va. Mr. Hock

William J. Hock

was born in Ironton, Ohio, and entered Seaboard service in 1922 at Richmond, Va., receiving successive promotions both in the freight and express traffic departments.

J. T. Mitchell, assistant superintendent of the Carolina division, has been named superintendent of that division at Savannah, Ga., succeeding the late **M. H. Gold. Charles H. Cook,** trainmaster of the Virginia division at Raleigh, N. C., has been appointed assistant superintendent of the Carolina division at Savannah.

SOUTHERN PACIFIC. — E. W. Torian, general superintendent of transportation at Houston, Tex., has been promoted to assistant to executive vice-president at that point. **J. M.**

J. M. Hatcher

Hatcher, acting superintendent of transportation, has been appointed superintendent of transportation, and **J. J. Deasy** has been named assistant superintendent of transportation.

TERMINAL RAILROAD ASSOCIATION OF ST. LOUIS. — Ira Davis, vice-president and general manager, retired January 1, after 45 years of service. **Elwood Davis,** supervisor of transportation, has been appointed general manager, at St. Louis.

TUSKEGEE.—V. Parvin, general manager at Tuskegee, Ala., has been elected vice-president and general manager.

WESTERN PACIFIC. — K. V. Plummer, Jr., has been appointed assistant superintendent transportation at San Francisco. The position of acting assistant superintendent transportation, formerly held by Mr. Plummer, has been abolished.

OBITUARY

William J. Roach, assistant general passenger agent of the **Nickel Plate** at Chicago, died December 17.

Samuel G. Lutz, 87, retired vice-president and general traffic officer of the **Alton,** died December 17 at Sebring, Fla.

Ralph A. F. Schuff, 65, general storekeeper of the **Burlington,** died December 24 in Presbyterian Hospital, Chicago.

Vernon W. Foster, 73, retired vice-president and general counsel of the **Illinois Central,** died December 23 in Illinois Central Hospital, Chicago.

Robert J. Middleton, 73, retired chief engineer of the **Milwaukee,** died December 21 at Seattle, Wash.

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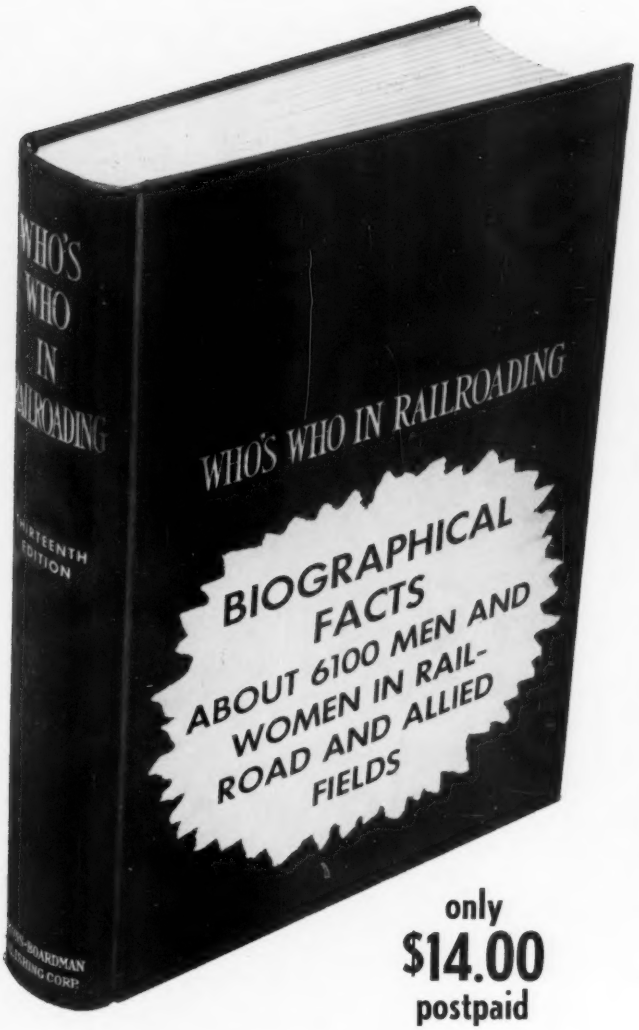

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